Interstate 8 and Interstate 10
Hidden Valley Transportation Framework Study

Chapter 1

Overview

August 2009

Prepared for

MARICOPA ASSOCIATION of GOVERNMENTS

Prepared by

AECOM

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1.1 Background and Purpose

The Interstate 8 and Interstate 10 Hidden Valley Transportation Framework Study is the second of the long-range planning studies that the Maricopa Association of Governments (MAG) will conduct in Maricopa County and adjacent counties. The purpose of these studies is to initiate the transportation planning process in areas that are expected to experience intense growth in population and employment over the next 30 to 50 years. MAG and its partners are beginning broad-brush planning in advance of the growth that will transform much of central Arizona from open desert to new communities.

The Hidden Valley Transportation Framework Study covers more than 2,000 square miles in Maricopa and Pinal counties—an area larger than the state of Delaware. Its approximate boundaries are Overfield Road (just east of I-10) on the east, 459th Avenue (seventeen miles east of the Maricopa County line) on the west, the Gila River on the north, and Interstate 8 on the south. The Hidden Valley region contains many specially designated or protected lands that constrain development, including several federal wilderness areas, the Sonoran Desert National Monument, and part or all of two sovereign American Indian communities: the Ak-Chin Indian Community and the Gila River Indian Community. Outside these lands, however, a great deal of developable territory exists on both private land and holdings of the Arizona State Land Department. The developable land, which includes numerous existing entitlements for master-planned communities and other residential and commercial centers, exists in the cities of Avondale, Casa Grande, Goodyear, Eloy and Maricopa; the towns of Buckeye and Gila Bend; and unincorporated Maricopa and Pinal counties

Table 1.1 summarizes the magnitude of expected growth, from 2005 to 2030 and to "Buildout," which will occur at various times in different communities, but most likely after 2050. Buildout represents the limits of future land development

Table 1.1 Summary of Hidden Valley Study Area Socioeconomic Projections

Scenario (Year)	Population	Employment
2005	90,000	49,000
2030	448,000	224,000
Buildout (post-2050)	2,469,000	1,096,000

Sources: MAG Geographic Information Systems, 2007; Arizona Land Resource Information System, 2006

1.2 Objectives of the Study

The MAG Hidden Valley Transportation Framework Study is intended to meet the following objectives:

- To lay out a conceptual network of new high-capacity transportation corridors for freeways, parkways, arterials, and public transit throughout the study area.
- To identify potential system and traffic interchange locations on I-8, I-10 and newly proposed freeways (or other access-controlled facilities).
- To establish access management strategies for high-capacity corridors to ensure efficient and safe operation of roadways and transit.
- To prepare a comprehensive set of maps illustrating characteristics of the study area's natural and man-made environment.
- To integrate recommendations with results of the recently completed MAG Interstate 10/Hassayampa Valley Framework Study, which covered over 1,400 square miles north of the western Hidden Valley study area.
- To establish logical phasing of major transportation improvements to the year 2050.
- To specify future transportation corridors in which right-of-way should be preserved now.
- To investigate alternative funding strategies to pay for the proposed transportation concepts.

1.3 Study Oversight and Review

Two groups of agency stakeholders provided guidance and oversight throughout the study. The **Funding Partners** represented the following agencies, besides MAG, that provided financial support for the study:

- Arizona Department of Transportation (ADOT)
- Town of Buckeye
- City of Goodyear
- City of Maricopa
- Maricopa County Department of Transportation (MCDOT)
- Pinal County Department of Public Works

Additional **Contributing Partners** that frequently reviewed proposed transportation alternatives and variations were:

- City of Casa Grande
- Central Arizona Association of Governments (CAAG)

The **Study Review Team** (SRT) was a larger group that acted as a sounding board and forum for discussion of progress at key milestones. The SRT provided valuable advice and information from a wide range of agencies and jurisdictions. The SRT included the following members as well as the Funding Partners and Contributing Partners:

- Ak-Chin Indian Community
- Arizona Department of Environmental Quality
- Arizona Game and Fish Department
- Arizona State Land Department
- City of Avondale
- City of Eloy
- Federal Highway Administration
- Flood Control District of Maricopa County
- Town of Gila Bend
- Gila River Indian Community
- U.S. Air Force (Luke Air Force Base and Goldwater Range)
- U.S. Bureau of Land Management

The Funding Partners generally met at least every other month through most of the study. Together with the Contributing Partners, they made the major decisions and provided continuous direction to the MAG study team. The SRT met as needed, but typically every two to three months.

Interstate 8 and Interstate 10 Hidden Valley Roadway Framework Study

Chapter 2

Public Involvement Process

August 2009

Prepared for

MARICOPA ASSOCIATION of GOVERNMENTS

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2.1 Overview

The MAG project manager served as the key contact person for the Hidden Valley study process. MAG public outreach staff provided guidance and review related to the study's public outreach and communication efforts. The consultant team, led by AECOM, was responsible for maintaining a database of all interested stakeholders; organizing, conducting and documenting stakeholder interviews; preparing for and implementing study forums and workshops; and (with the MAG project manager) making presentations on the study. Presentations involved appropriate audio-visual techniques such as PowerPoint. The goal of the public involvement process was to reach community consensus on a preferred mutimodal transportation framework that the MAG Regional Council can accept.

2.2 Public Involvement Plan

Ensuring that a wide range of public and stakeholder involvement opportunities exists on all MAG transportation studies is very important. MAG is dedicated to taking a proactive approach in soliciting citizen and stakeholder comments early and often.

At the outset of the study, a public involvement plan described how the MAG/consultant study team would involve stakeholders and the community in the development of the Hidden Valley regional transportation framework. The plan established strategies for a high-quality program to identify, educate, inform, and engage stakeholders throughout the process.

The public involvement plan explains the steps that the study team will take to ensure citizen and stakeholder involvement throughout the study. The plan seeks to establish a collaborative environment that will promote understanding and useful input. Stakeholders, landowners, and residents must sense that their involvement is genuinely desired and that the time they spend is worthwhile. This is particularly important for attracting very diverse groups and those that may be skeptical or timid about participating. The plan guided the outreach process to meet the study objectives.

An appendix to the final report compiles input received throughout the planning process.

2.3 Involvement Techniques

The outreach process included the following activities:

- Development forums (two)
- Key stakeholder interviews (throughout the study)
- Focus Groups (three)
- Community Workshops (two sets—each held at three locations for a total of six)
- Elected Official Briefings (two rounds)

2.3.1 Development Forums

The team organized and conducted two development forums. The objective of the first development forum, held June 7, 2007 at Central Arizona College, was to understand issues, concerns, opportunities, and current/proposed development projects within the planning area. At the second forum on May 15, 2008, also at the college, the study team obtained ideas and comments on the preliminary draft transportation framework. Each forum was scheduled for approximately two to three hours, allowing ample time for a PowerPoint presentation followed by opportunities to express ideas, comments and criticism. The second forum was conducted on the same day as a workshop for the Pinal County Comprehensive Plan, to ensure close coordination of the two projects.

2.3.2 Individual Stakeholder Meetings and Interviews

To understand issues, development trends and opinions about the future, the team conducted dozens of stakeholder meetings and interviews throughout the study. Team members conducted them and prepared notes of each. These discussions with individuals or small groups identified common themes and divergent viewpoints throughout the study area. They also provided essential input on both short- and long-term development plans, and numerous suggestions for specific changes to network alternatives and the recommended transportation framework. Many stakeholders, including major developers, landowners and their representatives, were interviewed several times as the proposed Buildout transportation system evolved.

2.3.3 Focus Groups

Three focus groups were conducted in Phoenix on January 24, 2008 to obtain specialized input on topics of particular importance. The topics were:

Environmental interests
Commercial transportation
Intergovernmental coordination

Each session brought together an invited group of experts who could offer specialized knowledge key study elements. The groups helped the study team uncover opportunities and constraints affecting the framework of future transportation systems. Team members with extensive experience in facilitation led each discussion.

2.3.4 Community Workshops

Two sets of community workshops solicited input from the entire community on Hidden Valley study issues and network alternatives. The objectives were to inform the public and stakeholders, discuss issues, obtain input on the alternatives and their proposed elements, and solicit additional ideas. Each workshop was held on consecutive evenings at three locations: Casa Grande, Maricopa, and the Goodyear/Mobile area.

Interested stakeholders, developers, landowners, agencies, and citizens were invited to participate in the community workshops. Media releases were distributed to newspapers throughout the study area and information was disseminated through the study web page. Information to encourage participation was sent to cities and counties for inclusion on their websites. The MAG study team prepared handouts, wall displays, comment cards, and a PowerPoint presentation.

Workshop #1: Review existing conditions and identify issues (February 2008)
Workshop #2: Input on the draft framework alternatives (February 2009)

In addition to these workshops, senior members of the study team made themselves available for presentations to special interest groups at their scheduled meetings. As examples, there were multiple presentations to the Transportation Committee of the Pinal Partnership, the Rainbow Valley Citizens' Organization, and groups of property owners and developers.

2.3.5 Briefings of Elected Officials

The MAG study team made presentations to the governing bodies of local jurisdictions and Indian communities, and also met with individual members or committees thereof. Examples of the latter included meetings with the Maricopa County supervisor and the Pinal County supervisor whose districts cover most of the Hidden Valley. Two rounds of formal briefings took place. In the first round, the study team presented the study scope and objectives, solicited input on issues, and obtained ideas for the generalized framework. In the second round, the team presented the recommended framework to ensure a regional consensus.

2.4 Communication Techniques

2.4.1 Stakeholder/Community Database

During the study initiation phase, the study team compiled a database of interested individuals and organizations. A comprehensive list was especially important because of the long-term regional implications of this pioneering planning effort. As more stakeholders were identified during the planning process, they were added to the database and placed on the contact list.

The following is a partial list of stakeholders who were contacted and kept informed:

- ADOT
- Maricopa and Pinal counties (Management, Transportation/Public Works, Planning & Development)
- Flood Control District of Maricopa County
- Indian communities
- All cities and towns in the study area
- Federal Highway Administration
- Arizona State Land Department
- Arizona Game & Fish
- U.S. Bureau of Land Management
- U.S. Department of Defense bases and installations
- Utilities serving the study area or with facilities therein
- Irrigation districts and other special districts
- Developers and landowners
- Union Pacific Railroad
- Economic development organizations
- Valley Partnership, Pinal Partnership and other civic organizations
- School districts and other educational institutions (e.g., Central Arizona College)
- Other special districts
- Homeowners associations and other interested citizens groups

2.4.2 Newsletters

The MAG team created a newsletter devoted to the study. Three editions of the newsletter were distributed at strategic points in the process. The purpose of the newsletters was to educate the community about the study, present planning concepts and alternatives under consideration, and promote study-related events. The consultant team created the newsletter and MAG distributed it. MAG posted the newsletters on its website and distributed them both electronically and at the community workshops.

MAG published the first newsletter in January 2008, shortly before the first round of community workshops. The second newsletter in May 2008 was intended to stimulate interest in the second development forum. The final newsletter, issued in February 2009, coincided with the second set of community workshops.

2.4.3 MAG Website

The study team communicated information about the study process and products through a dedicated page on the MAG website. The page was interactive, allowing visitors to ask questions and provide comments, in addition to receiving information on upcoming meeting dates and the status of the study. MAG established a special e-mail address (hiddenvalley@mag.maricopa.gov) for all electronic communications regarding the Hidden Valley study.

2.4.4 Executive Summary Poster

MAG and its consultant created a double-sided, 34" x 44" foldout poster to convey the findings and recommendations of the study to as wide an audience as possible. MAG distributed the poster to the Funding Partners, Study Review Team, MAG member agencies, and a variety of stakeholders that contributed to development of the regional transportation framework. A similar format proved very successful as means of disseminating results of the recently completed I-10 Hassayampa Valley Transportation Framework Study.

Interstate 8 and Interstate 10
Hidden Valley Transportation Framework Study

Chapter 3

Existing and Future Conditions

August 2009

Prepared for

MARICOPA ASSOCIATION of GOVERNMENTS

Prepared by

AECOM

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3.1 Introduction

This chapter presents an inventory and analysis of land use issues, existing and planned transportation facilities, and related findings of studies that are pertinent to the development of the Interstate 8 (I-8) and Interstate 10 (I-10)/Hidden Valley Transportation Framework Study (the "Hidden Valley Study"). Previous and current land use and transportation planning studies were gathered from the jurisdiction or agency coordinating each study.

The study area extends from approximately the Gila River on the north to the Barry M. Goldwater Air Force Range and Tohono O'odham Indian Community on the south (i.e., just south of I-8), and from 459th Avenue on the west to Overfield Road on the east, covering an area of approximately 3,000 square miles, as shown in Figure 3-1.

Figure 3-2 depicts the boundaries of all the jurisdictions and their municipal planning areas (MPA) within the study area, as well as generalized land ownership. A MPA is defined as the geographic area in which the municipal planning process is carried out. It includes, but is not necessarily limited to, the incorporated territory of the city or town. Seven municipalities lie wholly or partially within the Hidden Valley study area: the city of Avondale, town of Buckeye, city of Casa Grande, city of Eloy, town of Gila Bend, city of Goodyear, and city of Maricopa. Maricopa and Pinal counties have planning and zoning authority over the unincorporated areas, including areas inside a MPA but outside the current city or town limits. Within unincorporated areas, the county has planning authority over privately owned land. The county works jointly with the Arizona State Land Department (ASLD) on lands owned by ASLD outside municipal boundaries.

More than one-third of the study area is not under any local planning jurisdiction, but is federal land managed by the Bureau of Land Management (BLM). Most of the BLM land is located in Maricopa County, with the Sonoran Desert National Monument covering a large swath of land (approximately 486,000 acres) in the central part of study area. BLM-designated lands are under an extra layer of federal protection, meaning that any transportation infrastructure planned for this area will have to go through an added level of review.

In addition, slightly more than one-fifth of the study area lies within the Gila River Indian Community (GRIC) or Ak-Chin Indian Community. These communities are considered sovereign nations, over which state and local governments have no planning authority.

3.2 Environmental Context

This section describes the geology, topography, soils, land subsidence and earth fissures, drainage and water resources, biological resources, wildlife linkages, cultural resources, conservation areas, recreational opportunities, air quality, potential hazardous material locations, public utilities, and aviation facilities of the study area. There are also Title VI/Environmental Justice considerations. Environmental features and characteristics are illustrated in Figures 3-3 through 3-20 and discussed in the following subsections.

3.2.1 Geology and Topography

Principal Landforms

The study area is a mosaic of topographic features. It contains four primary mountain ranges, six wilderness areas and two regional parks.

Wilderness areas, managed by the BLM, are regions where land is left in a state of minimal human modification. Congress established these areas through the Arizona Wilderness Act of 1984 and the Arizona Desert Wilderness Act of 1990. The 13,500-acre Signal Mountain Wilderness Area is located at the northwest corner of the study area, 18 miles northwest of Gila Bend. This wilderness has sharp volcanic peaks, steep-walled canyons, arroyos, ridges and outwash plains. Signal Mountain, the highest peak in this wilderness, rises to an elevation of 2,182 feet above Mean Sea Level. To the southeast lies the 64,000-acre Woolsey Peak Wilderness Area, which encompasses a major part of the Gila Bend Mountains. The diverse topography and geology of this wilderness includes sloping lava flows, mesas, rugged peaks and ridges. The 3,270-foot Woolsey Peak, a landmark visible in much of southwestern Arizona, rises 2,500 feet above the Gila River.

Figure 3-1 Study Area

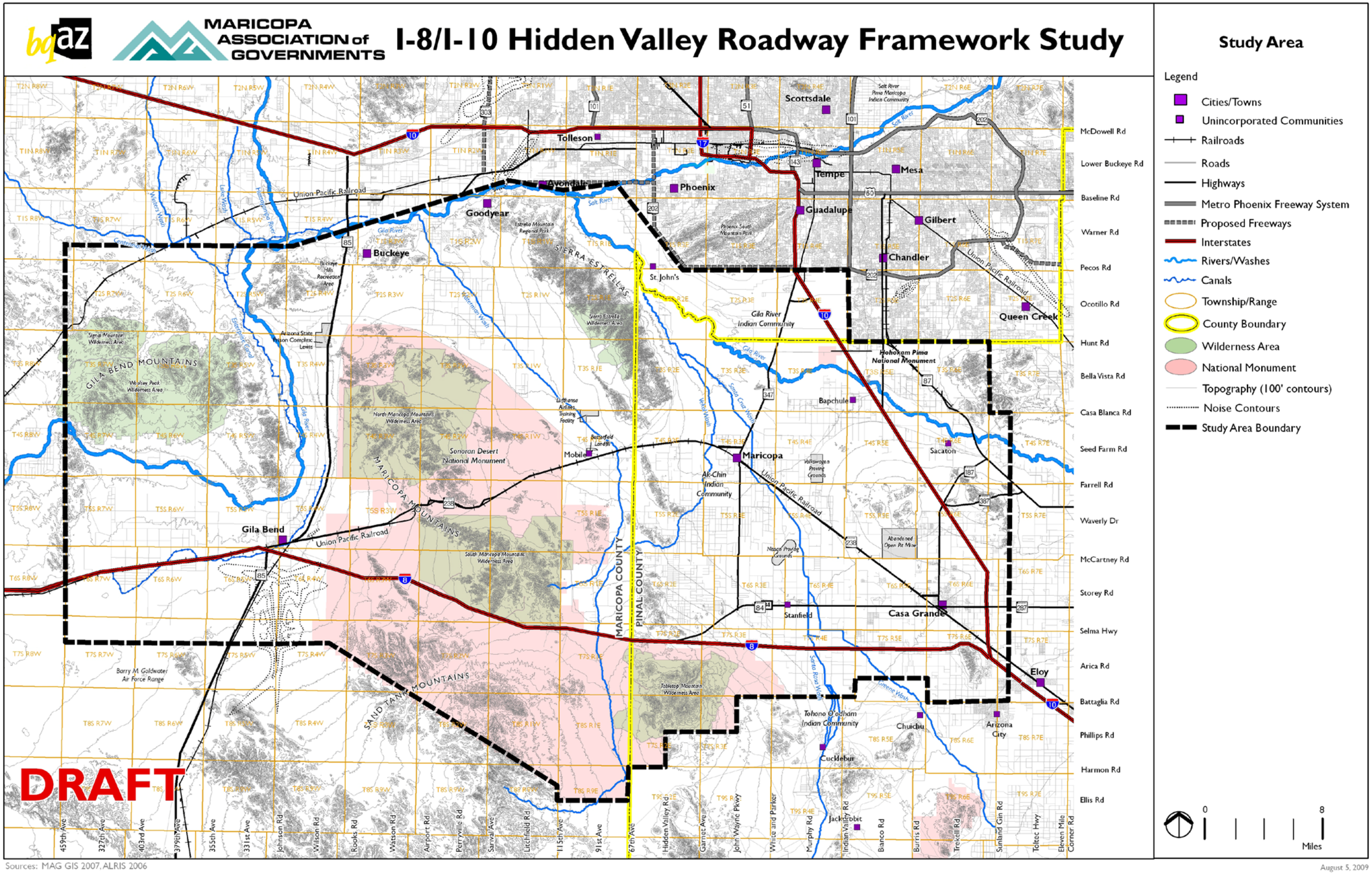
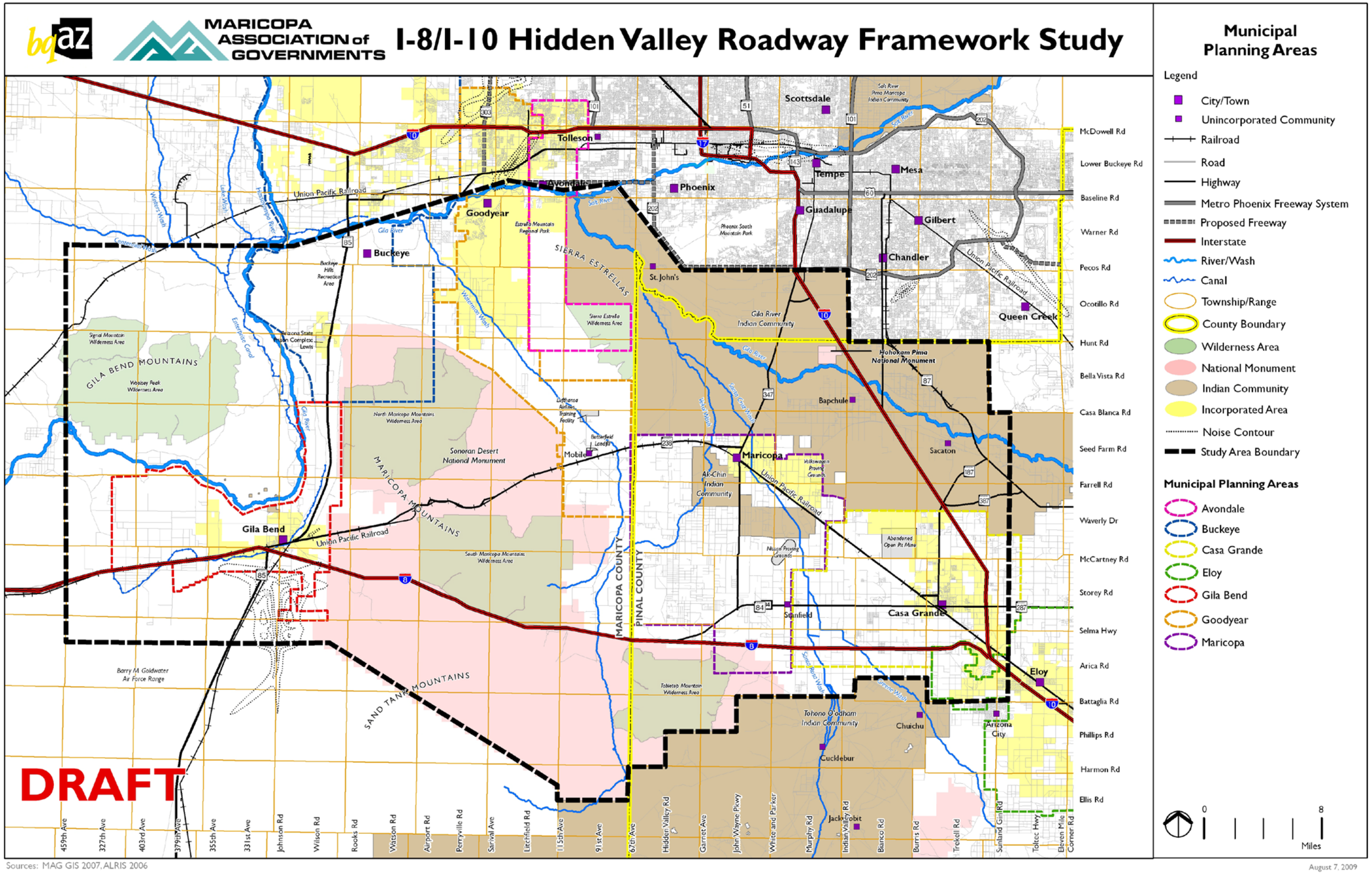


Figure 3-2 Municipal Planning Areas



The 63,200-acre North Maricopa Mountains Wilderness Area lies 12 miles east of Gila Bend and contains a 10-mile section of the Maricopa Mountains, a low-elevation (1,000 to 2,813 feet) Sonoran Desert range, and extensive surrounding desert plains. The 60,100-acre South Maricopa Mountain Wilderness Area, located south of the SR-238, contains 13 miles of the Maricopa Mountain Range. The eastern part of this wilderness has a screened mountainous interior formed by long ridges and isolated peaks compared to the desert flats on the western side. The Sierra Estrella Wilderness Area is the closest one to metropolitan Phoenix. Located approximately 15 miles southwest of Phoenix, it encompasses 14,400 acres in the northern part of the study area. This wilderness area has steep slopes and rocky canyons with the highest peak, Butterfly Mountain, rising to an elevation of 4,119 feet. In Pinal County, the 34,400-acre Table Top Wilderness Area lies in the southern part of the study area, 20 miles east of Casa Grande. Table Top Mountain, at 4,373 feet, is the highest peak in this area; its flat-topped summit is a familiar landmark.

Of the four mountain ranges in the study area, the Gila Bend Mountains in the eastern portion have elevations of 2,100 feet to 3,200 feet. The Buckeye Hills Recreation Area consists of 4,474 acres of rolling hills of the Sonoran Desert in the northwest part of the study area. Farther east, across Waterman Wash, lies the Estrella Mountain Regional Park in the Sierra Estrella Mountain Range. Most of this range is situated within the Gila River Indian Community. The highest points in this mountain range are typically above 4,000 feet. The 486,000 acres of the Sonoran Desert National Monument that spreads across the central portion of the study area contains the other two ranges: the Maricopa Mountains and the Sand Tank Mountains.

The six wilderness areas and the Sonoran Desert National Monument are managed by the BLM. Buckeye Hills Recreation Area and Estrella Mountain Regional Park are part of the Maricopa County park system.

Surface bodies of water (natural and man-made) include the Gila River, Salt River, Enterprise Canal, Waterman Wash, Vekol Wash, Santa Rosa Wash, Santa Cruz Wash and Greene Wash, along with several smaller streams.

Soils

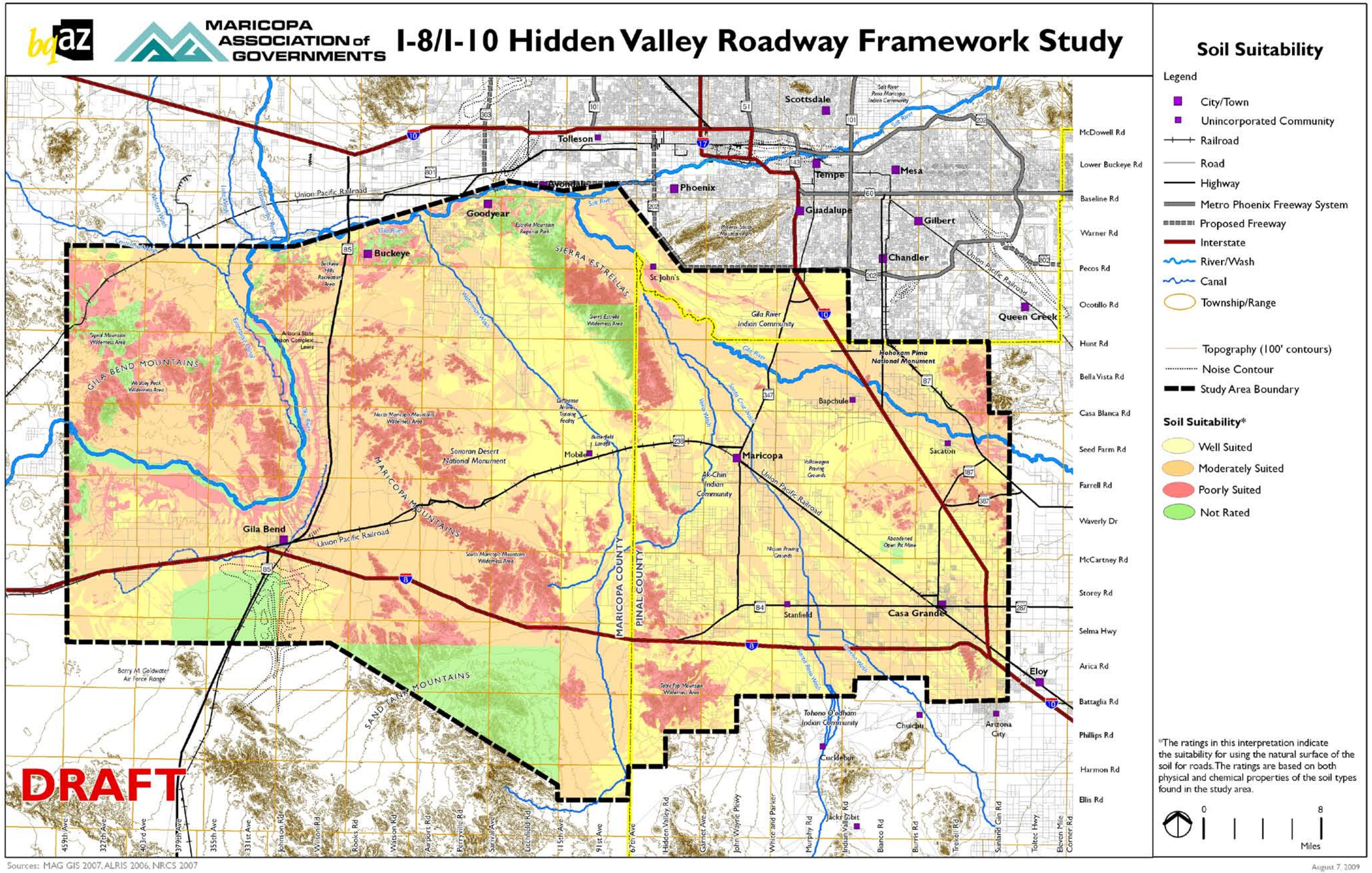
Figure 3-3 shows a soil suitability analysis for road construction in the study area. This analysis was taken from the United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) online survey tool. The analysis tool is called "Suitability for Roads (Natural Surface)" and it rates and groups various soil types in the study area. The ratings indicate the suitability for using the natural surface of the soil for roads. The ratings are based on slope, rock fragments on the surface, plasticity index, content of sand, the unified classification of the soil, depth to the water table, ponding, flooding, and the hazard of soil slippage. The Unified Soil Classification System is a soil classification system used in engineering and geology disciplines to describe the texture and grain size of a soil--characteristics that indicate how well a soil type would perform as a construction material.

The soils are described as "well suited," "moderately suited," or "poorly suited" to use for paved roadways. "Well suited" indicates that the soil has features that are favorable for roads, with no limitations. "Moderately suited" indicates that the soil has features that are moderately favorable for road construction. One or more soil properties are less than desirable, and fair performance can be expected. "Poorly suited" indicates that the soil has one or more properties that are unfavorable for roads. Overcoming the unfavorable properties will require special design, extra maintenance, and costly alteration.

As shown in Figure 3-3, most of the study area falls under the "moderately suited" category, with poor suitability around the mountainous areas, where steeper slopes increase the hazards associated with erosion. The six wilderness areas, two regional parks, Gila Bend Mountains, Sierra Estrella Mountains and Sand Tank Mountains generally have poor suitability for road construction. The tract of land between Waterman Wash and the Sierra Estrella Mountains, the area around Mobile, and small pockets of land around Sacaton and Stanfield have soils with good suitability for road construction. The areas with soils "well suited" to "moderately suited" for road construction have "flat" slopes, as discussed in the next subsection. The section of Barry M. Goldwater Air Force Range within the study area is not rated for soil suitability. Portions of the Sand Tank Mountains, Signal Mountain Wilderness Area, Sierra Estrella Wilderness Area, and Estrella Mountain Regional Park are also not rated. Neither are some areas along the Gila River, skirting the Gila Bend Mountains.

Almost half of the study area (48 percent) is moderately suited for road construction, 27 percent is well suited and 16 percent is poorly suited. The remaining 10 percent of the study area is not rated by the NRCS. (Percents do not add exactly to 100 due to rounding.)

Figure 3-3 Soil Suitability



Slope Analysis

Figure 3-4 shows the slope analysis for the Hidden Valley study area. Slope analysis aids in understanding the topography of a region and helps to delineate compatible and incompatible slopes for urban development. It is often combined with surface geology and soil data to determine the most appropriate sites for land uses and transportation corridors. The slope of a line segment is the ratio of the change in elevation (rise) to the horizontal distance between endpoints (run). The larger the rise (in absolute value) and the shorter the run, the steeper the slope.

The slopes for the study area have been divided into four ranges. Areas with slopes less than 5 percent are considered "flat," while slopes of 5 to 10 percent are "gradual." Slopes of 10 to 20 percent are "moderate," while slopes of 20 percent or more are "steep." The lighter shades on the map represent flatter terrain, while darker shades denote steeper slopes. Most of the study area falls under the "flat" category. Steep slopes (at least 20 percent) are found in mountainous areas, such as the Gila Bend Mountains and the Signal Mountain and Woolsey Peak wilderness areas in the east; the Sierra Estrella Mountains in the north; the North Maricopa and South Maricopa Mountains wilderness areas and the Maricopa Mountains near the center; and the Sand Tank Mountains and Tabletop Mountain Wilderness Area in the south. Small pockets of steep slopes exist near Queen Creek and Arizona City toward the eastern boundary of the study area, and in the Sonoran Desert National Monument farther west.

Slopes greater than 20 percent are considered unsuitable for intense urban development, because such steep slopes are prone to soil erosion and landslides (McBride, 2006). Furthermore, development on these slopes involves extensive cutting and filling, which damages the slope characteristics, affects the slope stability and creates significant visual scars. However, large portions of the study area, denoted by light yellow in Figure 3-4, have suitable slopes for urban development and transportation corridors. Most of the steeper slopes are located within the protected areas of national monuments or wilderness areas.

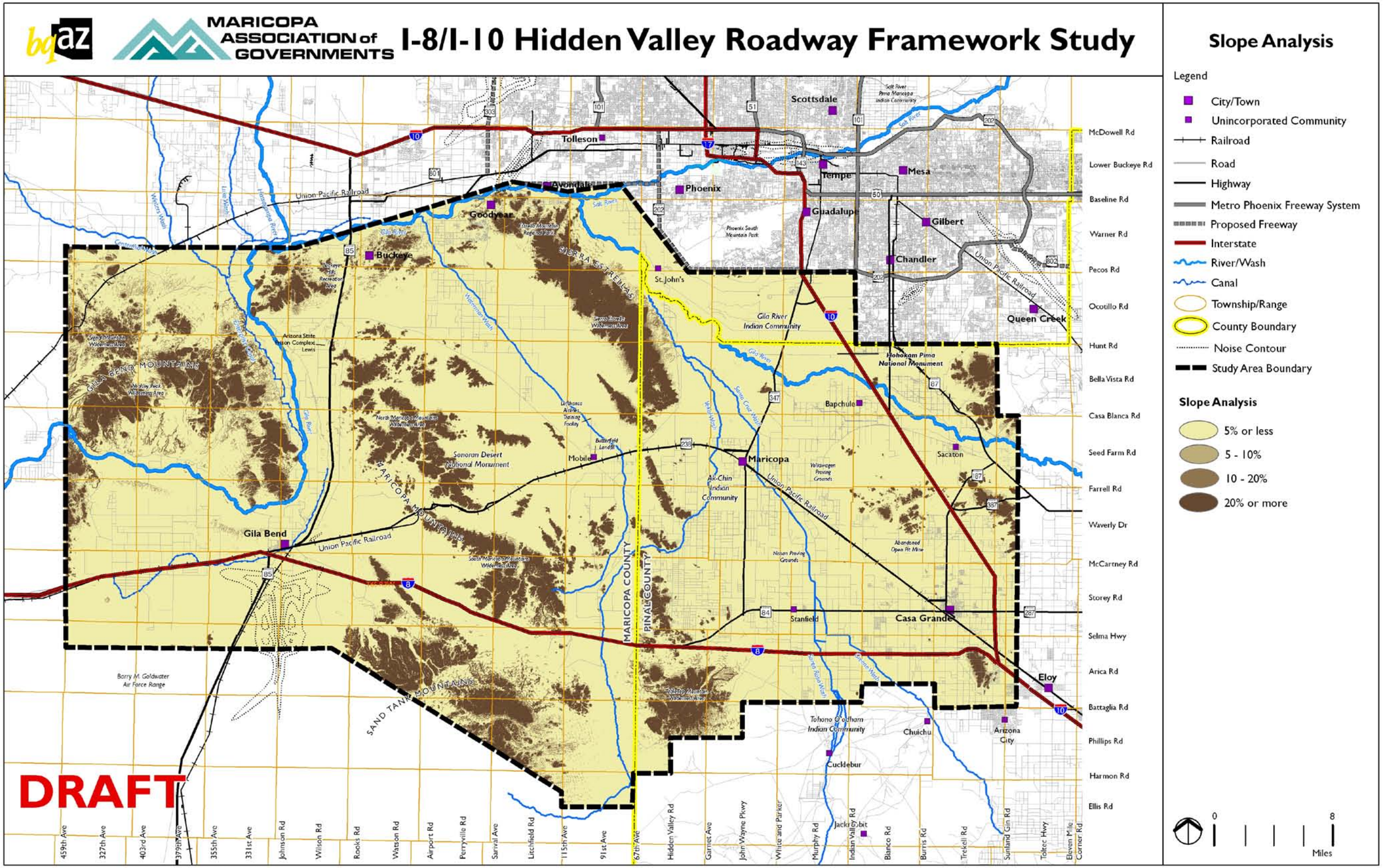
Land Subsidence and Earth Fissures

Land subsidence has been identified in several south central Arizona locations. This phenomenon occurs when water is removed from underground reservoirs and the weight of the overlying material compresses, causing the land to settle. Once compressed, alluvial deposits take up less space than before and the ground surface sinks. The amount of subsidence varies by location. Land subsidence creates another potential problem: earth fissures. These are cracks in the ground surface that occur because of uneven or differentiated land subsidence. Depending on circumstances, fissures can form gullies as much as 50 feet wide and 10 to 15 feet deep. Once fissures start to form, they tend to increase in number and length, spreading at uneven speeds and directions for several miles.

The effects of land subsidence and earth fissuring can be significant, because they may cause significant damage to infrastructure, increase flooding potential, worsen groundwater pollution, and accelerate soil erosion. Continued urban development on lands that require groundwater pumping ensures a future land subsidence problem.

Many occurrences of land subsidence exist in the Pinal County part of the study area. Eloy, just outside the study area, is a center of subsidence activity. Major subsidence also exists in Stanfield and (the city of) Maricopa. A substantial tract of land from Maricopa to Stanfield is affected by fissures. Large portions of land in the study area have seen a decline of more than 100 feet in the ground water level since the pre-development period in the 1940s. Such areas are found mainly along the Gila River between the Gila Bend Mountains and the Sonoran Desert National Monument in Maricopa County. Almost all of Pinal County within the study area has seen a decline in ground water levels. Figure 3-5 shows the geologic hazards in the study area.

Figure 3-4 Slope Analysis



Sources: MAG GIS 2007, Pinal County Parks and Open Space Plan 2007

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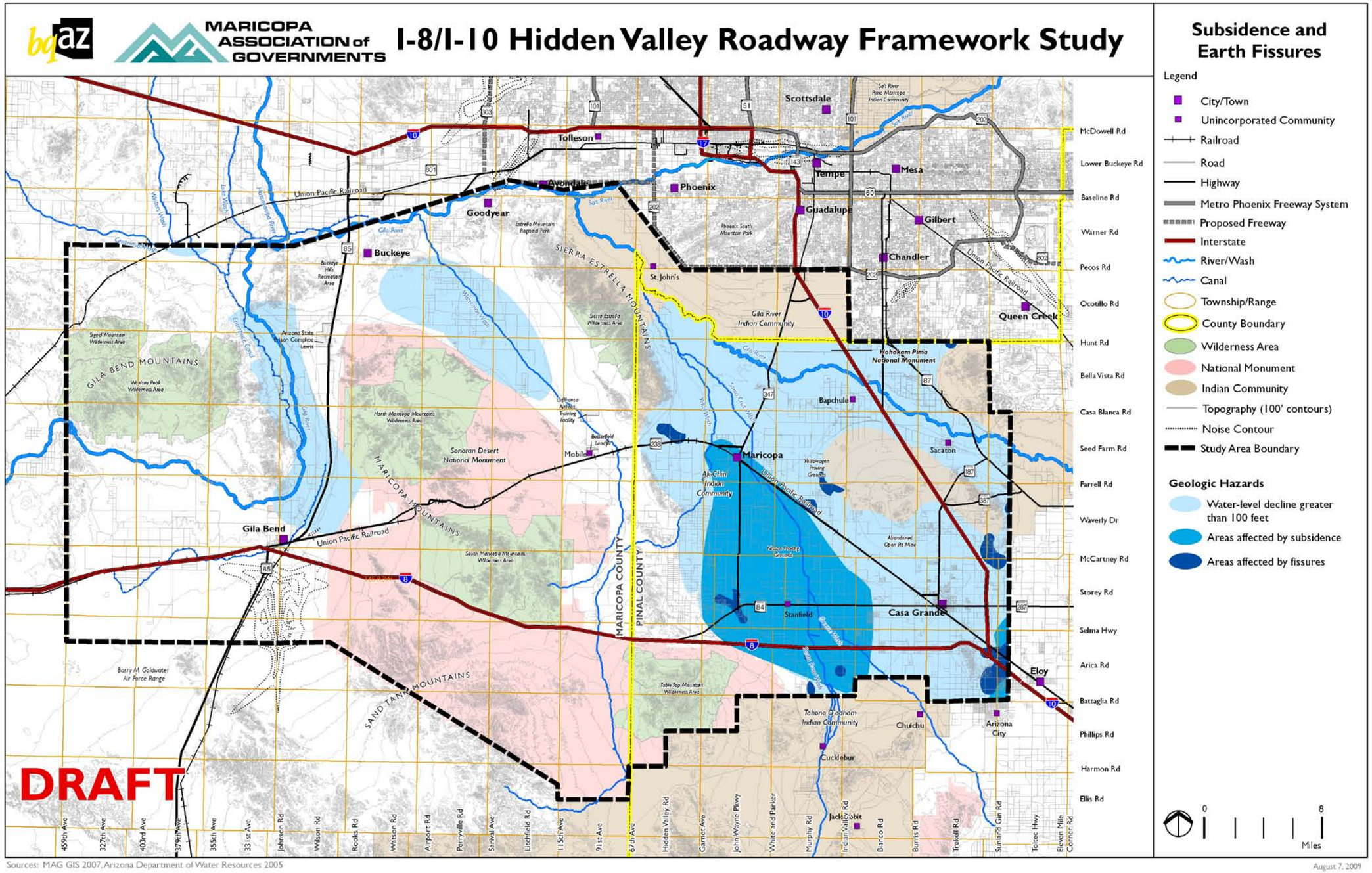
Figure 3-5 Subsidence and Earth Fissures



3.2.2 Drainage and Water Resources

Major Watercourses and Drainage Features

The Arizona Department of Water Resources (ADWR) has established Active Management Areas (AMA) to provide long-term management and conservation of limited groundwater supplies. Most of the municipalities have a series of water conservation programs and activities in these AMAs. There are two AMAs in the Hidden Valley study area: the Phoenix AMA and the Pinal AMA, as well as the Lower Colorado planning area. The Phoenix AMA is located in central Arizona and covers 5,646 square miles. This AMA is characterized by a diverse mix of water uses with an emphasis on municipal and industrial uses. It is drained by the Gila River and its four principal tributaries: the Salt, the Verde, the Agua Fria, and the Hassayampa. Within the study area, this AMA covers the northern part in Maricopa County down to south of Mobile. The Pinal AMA spans over 4,000 square miles. The main goal of this AMA is to allow the development of non-irrigation uses and to preserve existing agricultural economies. This AMA covers the Pinal County portion of the study area. Outside the AMAs, ADWR has created planning areas for the management of water resources. These planning areas consist of groundwater basins, sub-basins and watersheds. The Lower Colorado River Planning Area covers approximately one-third of the study area, from the western boundary of the study area to (roughly) the Sonoran Desert National Monument. It consists of two groundwater basins: Gila Bend and the Lower Gila basin.

There are five watersheds in the study area and the major watercourses drain into these watersheds. Figure 3-6 shows the major water resources, drainage features and watersheds in the study area.

The Gila River, a tributary of the Colorado River, flows from east to west and enters the study area in Pinal County, crossing the Gila River Indian Community as an intermittent stream because of its use as a water source. It continues to flow along the northern boundary of the study area and turns southward abruptly along the Gila Bend Mountains west of its confluence with the Hassayampa River. There is a sharp bend in the river north of Gila Bend, where it changes course from nearly due south to generally westerly, before its confluence with the Colorado River near Yuma.

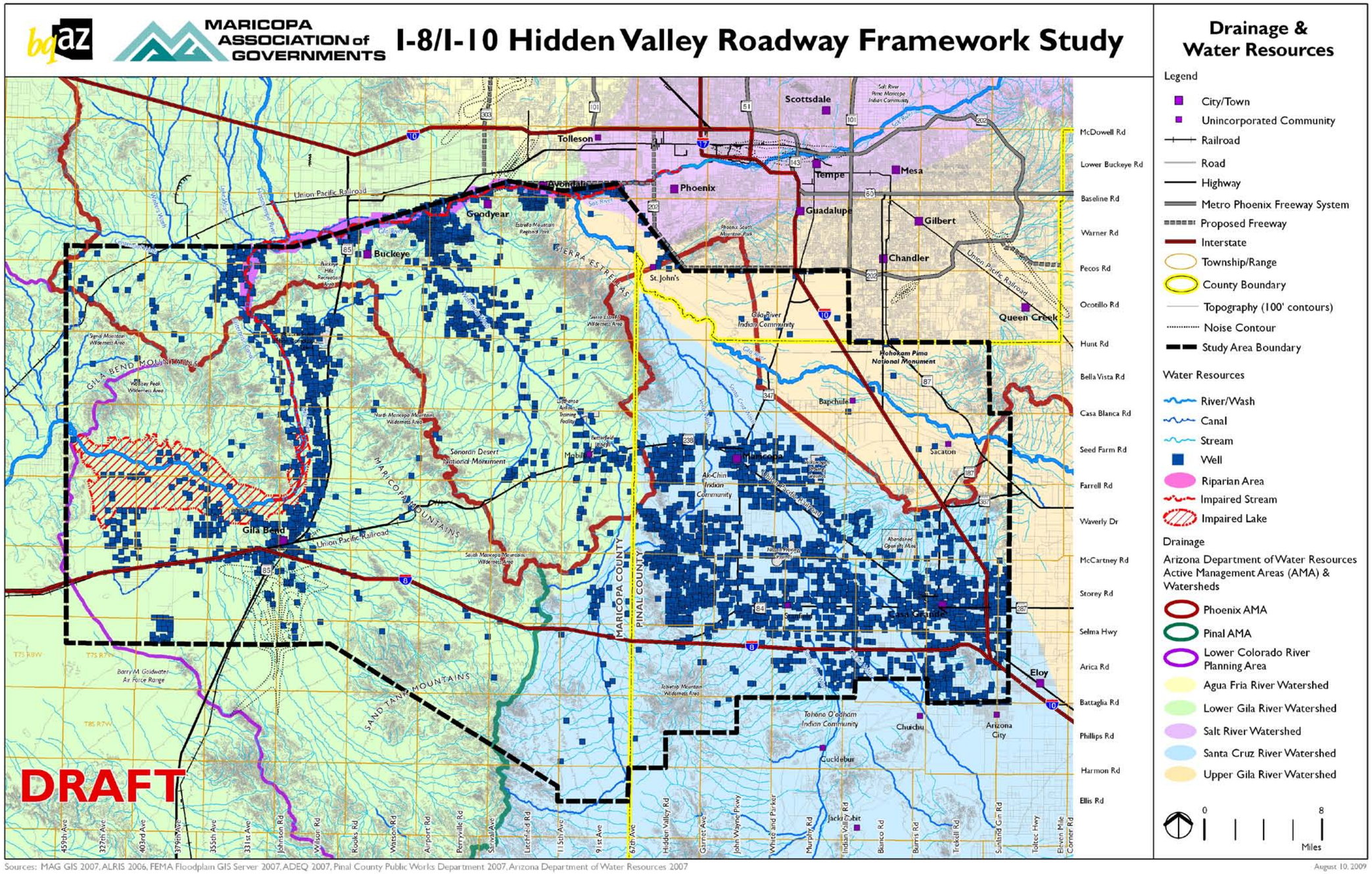
The Salt River, a tributary of the Gila, flows into the study area for a short distance before it merges with the Gila River in the northern part of the study area.

The Enterprise Canal flows from north to south from its starting point at the confluence of the Hassayampa River and the Arlington Canal until it meets the Gila River, before the river bends abruptly around the Gila Bend Mountains and flows westward out of the study area. The drainage area of this canal is approximately 49,650 square miles.

Waterman Wash traverses the study area diagonally (roughly northwest to southeast) from Buckeye and travels along the relatively flat expanse of land between the North Maricopa Mountains Wilderness Area and the Sierra Estrella Wilderness Area. It crosses Mobile and curves around in a southwest direction until it ends in the South Maricopa Mountains Wilderness Area. Farther east, Greene Wash, Santa Cruz Wash, Santa Rosa Wash and Vekol Wash all flow south to north, toward the Gila River, in the Maricopa area.

The Painted Rock Dam is located 20 miles northwest of Gila Bend on Painted Rocks Dam Road off I-8. This dam was constructed in 1959 to control floodwaters that periodically damaged downstream areas. The dam site is between the Gila Bend Mountains and the Painted Rock Mountains, just outside the study area. It is operated by the U.S. Army Corps of Engineers, Los Angeles District. It has a drainage area of 50,800 square miles. This dam suffered extensive damage during the 1993 floods. The Painted Rock Reservoir is now an impaired lake, closed to the public because of its toxicity from pesticide contamination.

Figure 3-6 Drainage and Water Resources



Wells

ADWR regulates and permits ground water wells within the State of Arizona. Wells represent the location of a withdrawal of groundwater, and are a concern because of their potential to affect groundwater flows and levels as well as their access to pollutant-contaminated water. Wells can be classified as either abandoned or in water production. A well is classified as abandoned when ADWR certifies that it has been properly filled or sealed so that no water can move through it vertically.

There are a number of wells within the Hidden Valley study area, concentrated in populated areas near surface and groundwater sources. As seen in Figure 3-7, several wells are located along the Gila River near Gila Bend, as well as along Waterman Wash and the Salt River. The majority of the wells within Hidden Valley are in the southeastern quadrant of the planning area, concentrated in the area surrounding Maricopa and Casa Grande (which are the principal population centers of the study area).

Flood Hazards

The Federal Emergency Management Agency (FEMA) has identified and mapped flood hazards in the United States. Flood hazard areas are rated according to the likelihood of being inundated by floodwaters in any given year. The height of a base flood, usually reported in feet above the ground surface, is called the Base Flood Elevation (BFE). A 100-year floodplain is defined as an area of land that has a one percent chance of being inundated by a flood in any given year. No BFEs or depths are available for such areas. A common floodway, as it is referred to in this report, is a 100-year floodplain for which BFEs are available.

Portions of the study area are located within FEMA-designated floodplains. As seen in Figure 3-7, most of the study area east of SR-85 and south of the Sierra Estrella Mountains lies in a Minimal Flood Hazard Area, with the exception of a Special Flood Hazard Area in Maricopa and along the Greene Wash and Santa Cruz Wash in Pinal County. Moderate Flood Hazard areas exist in the western and northwestern parts of the study area around the Gila River and Waterman Wash. (A Minimal or Moderate Flood Hazard Area is one where flood insurance is available, but not mandated by federally regulated lenders.) A Special Flood Hazard Area is an area at higher risk of flooding. Such areas are found all along the Gila River from its confluence with the Salt River until it exits the study area. The Painted Rock Reservoir, just north of Gila Bend, is another such area.

Impaired and Unique Waters

The Arizona Department of Environmental Quality (ADEQ) has developed standards for surface water quality around the state and continually conducts monitoring and assessment to determine whether these standards are being met. These standards are formulated according to the use of a waterbody (body of water)–for example, support of aquatic life or recreational fishing. When monitoring and assessment determine that water quality standards are not being met, a waterbody is listed as impaired. The Gila River is an impaired stream from its confluence with the Salt River until it meets the Enterprise Canal, just north of the Painted Rock Reservoir. As mentioned above, the reservoir is an impaired lake.

A unique water is a surface waterbody that has been classified as an outstanding resource in Arizona, and that is in free-flowing condition with good water quality and exceptional recreational or ecological significance. There are no unique waterbodies within the study area.

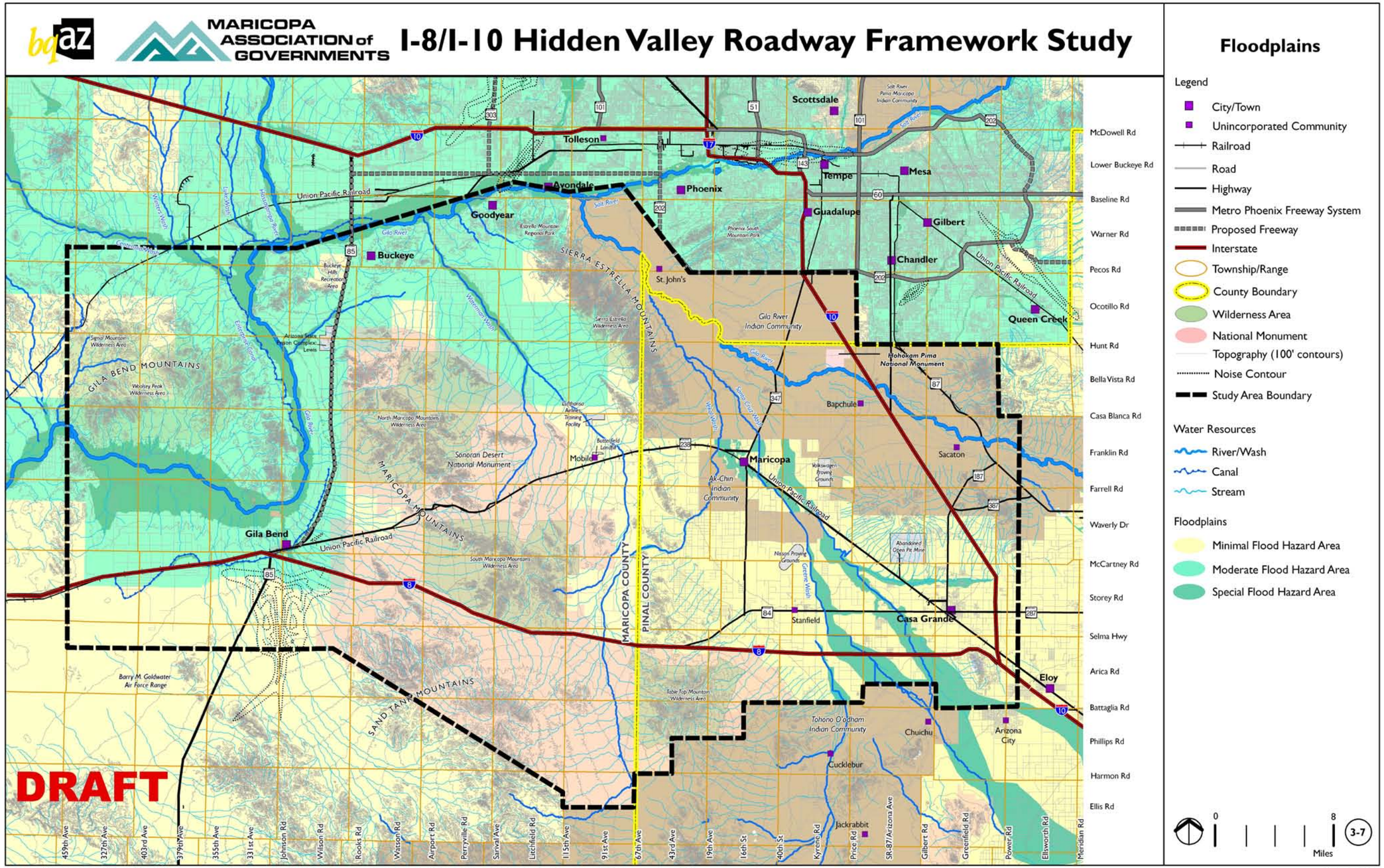
Sole Source Aquifers

There are no sole source aquifers in the study area. The nearest one is the Upper Santa Cruz and Avra Basin Sole Source Aquifer, whose northern limits are located near the Pinal-Pima County line.

Drainage Studies

There are several governmental agencies with jurisdiction in the Hidden Valley study area that conduct studies evaluating the natural drainage systems, watercourses and watersheds in order to determine the potential flood hazards to existing and future development. The main agency in Maricopa County conducting such studies is the Flood Control District of Maricopa County (FCDMC).

Figure 3-7 Floodplains



Acting as a participating agency in conjunction with any involved municipalities and/or the U.S. Army Corps of Engineers, FCDMC is currently overseeing, or has recently completed, several regional projects within the study area. Further information on these studies is available through the agency at www.fcd.maricopa.gov. The below-described projects encompass areas of hydraulic characteristics and flood hazards that would affect development within the Hidden Valley. Figure 3-8 shows the project boundaries of these studies.

- *Gila Bend Area Drainage Master Plan*: An Area Drainage Master Plan (ADMP) goes a step further than an Area Drainage Master Study and identifies criteria and standards for flood contro l and drainage to be used in land use and development planning in the region. The Gila Bend AMDP is a completed project that assessed 48 square miles surrounding the Gila River to develop an overall drainage plan to ensure that future growth will provide adequate storm water conveyance. The project identified existing drainage problems and developed corrective measures. Floodplain delineations developed for this plan are currently awaiting approval from FEMA.

- *Waterman Wash Tributaries Floodplain Delineation Study*: This completed study assessed 165 linear miles of new wash floodplains that encompass drainages in the Rainbow Valley, between the Sierra Estrella Mountains and the Maricopa Mountains. The study developed maps submitted to FEMA that are used for floodplain management.

- *El Rio Watercourse Master Plan*: A Watercourse Master Plan examines the relationship between existing and future development in a floodplain and watershed, while assessing the potential damages in order to create a regional plan to minimize them. The El Rio watercourse extends 17 miles along the Gila River, from its confluence with the Agua Fria River to MC-85, in the north central part of the Hidden Valley study area. This active project involves FCDMC and the municipalities of Buckeye, Avondale and Goodyear. It is exploring options to restore the watercourse to its natural state and provide recreational opportunities.

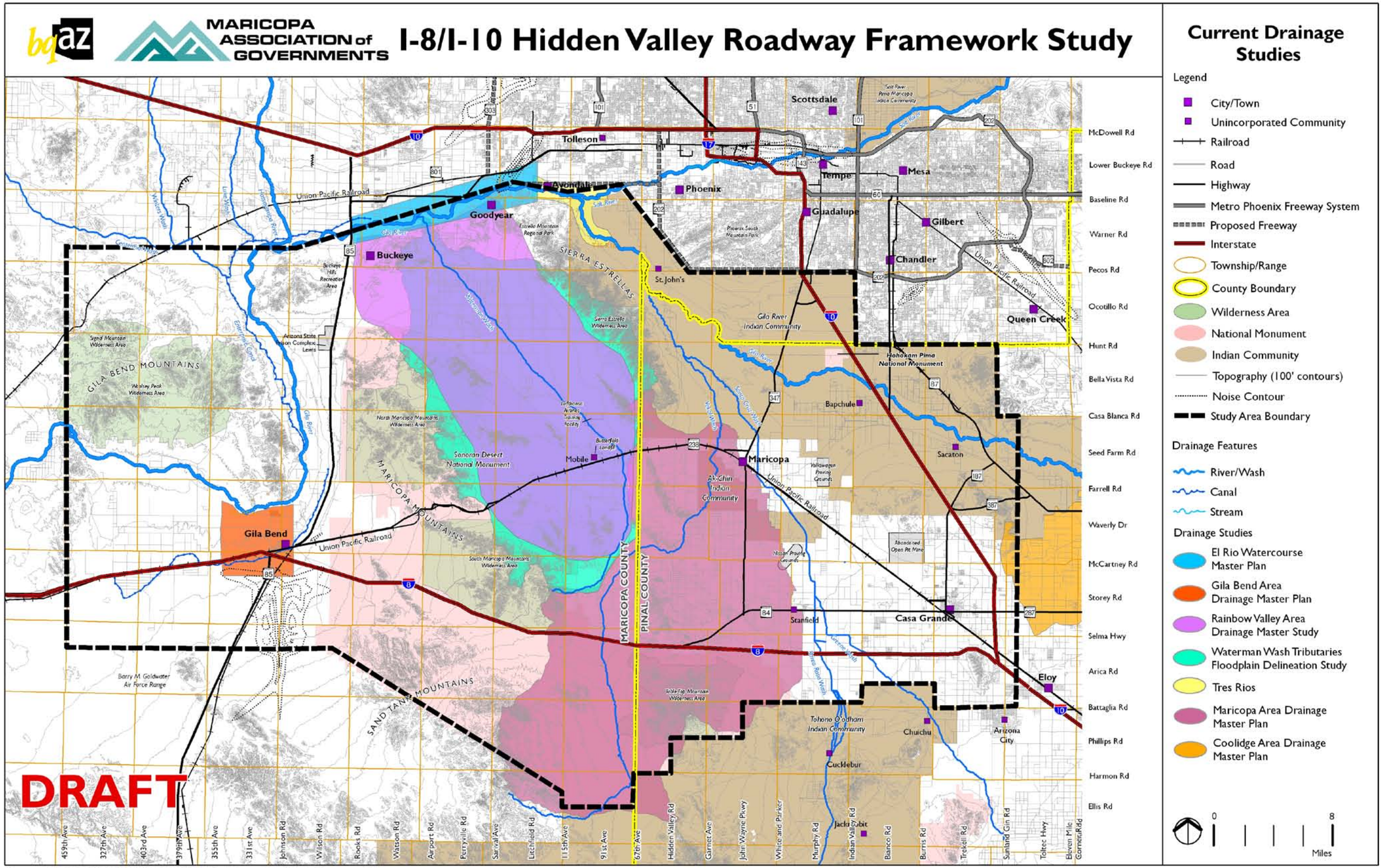
- *Tres Rios*: FCDMC is currently conducting the Tres Rios study in conjunction with the Army Corps of Engineers and the city of Phoenix. The planning area encompasses the Salt and Gila rivers from approximately 91st Avenue to the Agua Fria River. Flood hazard management strategies being investigated include improvements to the north bank levee, channelization, open water marsh and wetland habitat areas, and an associated pump station to provide water to these habitat areas.

- *Rainbow Valley Area Drainage Master Study*: An Area Drainage Master Study (ADMS) is a precursor to ADMP that develops a hydrologic overview for a watershed, outlining potential flood hazard areas and drainage problems. The goal is to identify flood hazards and measures that can be used during the planning process to minimize those hazards to future development. The Rainbow Valley AMDS, to begin in late 2007 or early 2008, will examine the Rainbow Valley watershed in west-central Maricopa County. The planning area encompasses approximately 463 square miles. Dominant hydrologic features in this watershed are Waterman Wash and a number of significant alluvial fans.

- *Maricopa ADMP*: This study was conducted by the Pinal County Department of Public Works to anticipate potential flooding problems that may occur due to impending development in the study area, which encompassed approximately 322 square miles in unincorporated Pinal County (including Stanfield), and the city of Maricopa. The overall watershed covers 510 square miles and extends into Maricopa County. This study identified local and regional drainage issues and recommended best management practices, with a focus on flood and erosion control management in the Pinal County portion of the watershed. This study is one of 20 ADMPs to be completed over a five-year period that will cover all of Pinal County.

- *Coolidge ADMP*: The Coolidge watershed is another of the Pinal County ADMPs. This study includes an extensive inventory of existing and planned drainage facilities, identification of existing and potential drainage problems, and drainage guidelines for development. The study makes recommendations on general drainage issues as well as special drainage concerns like the Picacho Reservoir and Dam. The surrounding area is experiencing rapid residential and commercial development.

Figure 3-8 Current Drainage Studies



Sources: MAG GIS 2007, ALRIS 2006, FCDMC 2007, Pinal County Public Works Department 2007

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3.2.3 Biological Resources

Vegetation

The Hidden Valley study area contains two distinct biotic communities, as shown in Figure 3-9. The location of these communities is largely dependent on moisture, rainfall and elevation. Table 3.1 describes representative habitat features of each biotic community.

Table 3.1 Biotic Communities in the Study Area

Formation	Biotic Community	Brief Description	Percent of Study Area Land
Sonoran Desertscrub	Arizona Upland Subdivision	Legume shrubs such as foothills paloverde, blue paloverde, ironwood, mesquite, cat-claw acacia, and fairy duster. Common cacti include the saguaro, barrel cactus, numerous chollas and one species of ocotillo.	48%
	Lower Colorado River Valley Subdivision	Creosotebush-white bursage series, saltbush series, creosotebush-big galleta series, Frankenia series, mixed-scrub series	52%

Source: Brown, David E., ed. 1994. Biotic communities. Southwestern United States and Northwestern Mexico. University of Utah Press. 301 pp.

The biotic communities within the study area consist of the Arizona Upland and Lower Colorado River Valley subdivisions of the Sonoran Desertscrub biotic community. The Arizona Upland Subdivision biotic community is generally present at higher elevations, such as the Sierra Estrella Mountains, Maricopa Mountains, Sand Tank Mountains, Tabletop Mountains, and Gila Bend Mountains. The Lower Colorado River Valley subdivision generally lies at those elevations below the Arizona Upland subdivision throughout the study area.

The natural vegetation in the study area provides habitats for various species of wildlife, including listed species. Careful planning for long-term development is needed to ensure sustainability of these vegetative resources.

Wildlife

Wildlife in the study area is expected to be diverse and directly related to the habitat types present and available. As outlined above, the study area traverses two biotic communities: the Arizona Upland and the Lower Colorado River Valley Subdivisions of the Sonoran Desertscrub. Based on these biotic communities, the following wildlife species may be present within the study area:

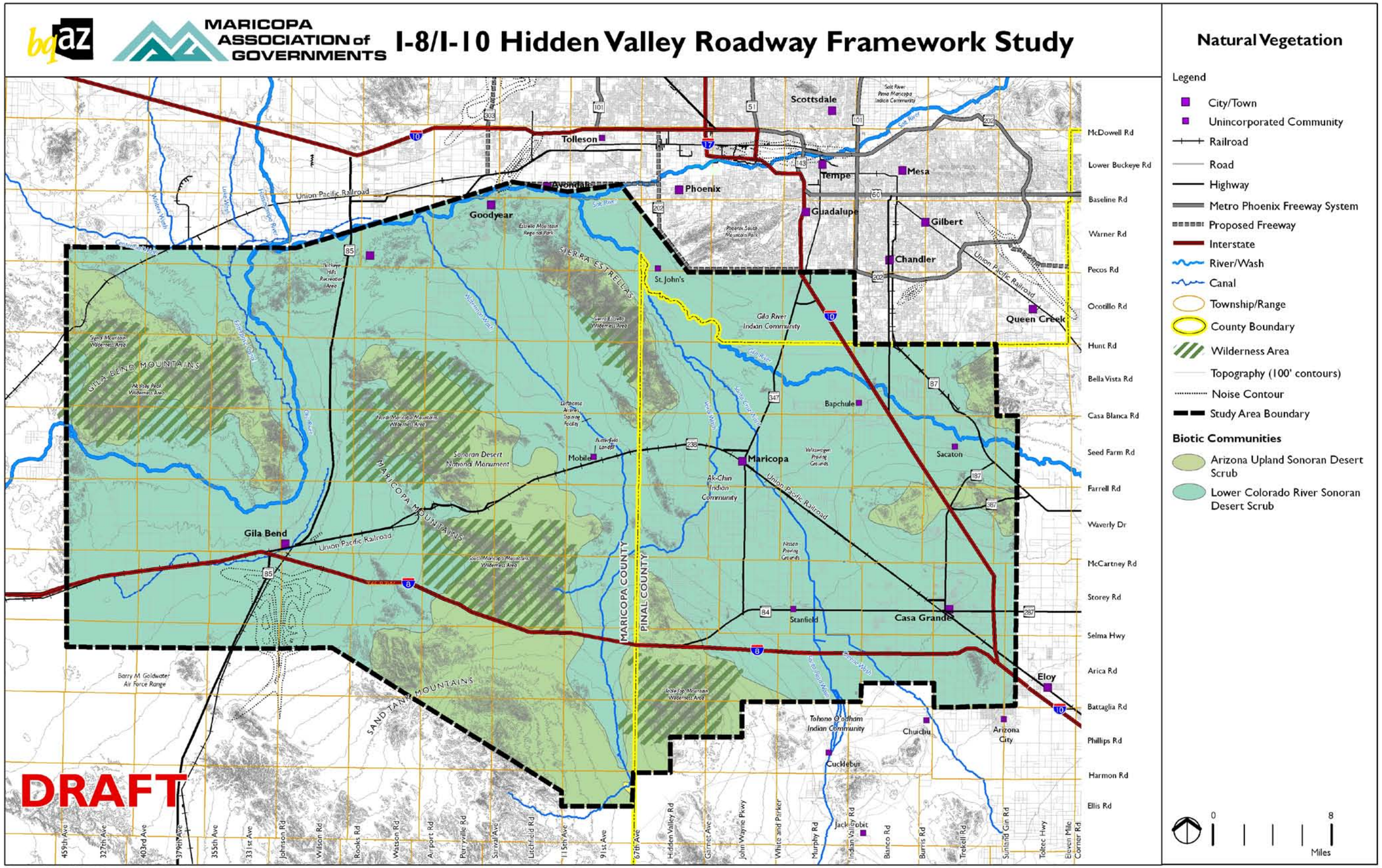
- Arizona Upland Subdivision of the Sonoran Desertscrub: Desert mule deer, javelina, California leaf-nosed bat, California myotis, black-tailed jackrabbit, Bailey's pocket mouse, cactus mouse, white-throated woodrat, gray fox, Harris antelope squirrel, Harris' hawk, white-winged dove, inca dove, elf owl, Wied's crest flycatcher, pyrrhuloxia, cactus woodpeckers, curve-billed thrashers, cactus wren, regal horned lizard, western whiptail, Gila monster, Arizona glossy snake, Arizona coral snake, and tiger rattlesnake.

- Lower Colorado River Valley Subdivision of the Sonoran Desertscrub: Desert bighorn sheep, Sonoran pronghorn, burro (introduced), coyote, round-tailed ground squirrel, kit fox, white-tailed antelope squirrel, desert pocket mouse, long-tailed pocket mouse, desert kangaroo rat, Merriam kangaroo rat, fringe-toed lizards, flat-tailed horned lizard, banded sand snake, sidewinder snake, chuckwalla, desert spiny lizard, southern desert horned lizard, western whiptail, desert glossy snake, black-chinned sparrow, burrowing owls, cactus wren, pyrrhuloxia, roadrunner, Gambel quail, Gila woodpecker, Phainopepla, inca dove, curve-billed thrasher, white winged dove and mourning dove.

Special Status Species and Critical Habitats

A review of the U.S. Fish and Wildlife Service (USFWS) and Arizona Game and Fish Department (AGFD) threatened and endangered species lists for Maricopa and Pinal Counties was conducted to identify those species that potentially occur within the study area. Table 3.2 provides a summary of this review.

Figure 3-9 Natural Vegetation



The general habitat types available within the study area were compared to those species that are known to occur within Maricopa and Pinal counties. A ranking of HIGH, MODERATE, or LOW was assigned to each species based on potential habitat availability. A ranking of LOW means that the species is rare or unlikely to occur within the study area; MODERATE means that the species has a reasonable probability to occur within the study area; and HIGH means that the species is likely to occur, or occurrences have been reported and documented.

Species of Concern and Candidate species are not afforded protection under the Endangered Species Act and have no regulatory listing status. Generally, these categories are identified during listed species reviews, as these species have the potential to become listed in the future.

The BLM and U.S. Forest Service (USFS) have identified Sensitive species known to occur on BLM or forest lands in Arizona. Coordination with the BLM and USFS is required to identify potential impacts to these species. The AGFD has identified certain species as Wildlife of Special Concern in Arizona; these species are known to be or may be in jeopardy or face known or perceived threats, including population decline. The individual Indian communities will need to be contacted regarding sensitive species within their lands. The Arizona Department of Agriculture Native Plant Law (1993) protects certain plant species from being collected or harvested. This listing includes Highly Safeguarded (HS) species, Harvest Restricted (HR) species, Salvage Restricted (SR) species, Export Restricted (ER) species, and Salvage Assessed (SA) species. The following restrictions apply to species in these categories:

HS	No collection permitted
HR	Permit required for removal of plant by-products
SR	Permit required for collection
ER	Out-of-state transport prohibited
SA	Permit required for live tree removal

The Cactus Ferruginous Pygmy Owl (CFPO) and the Arizona Agave have been delisted by the USFWS, but the CFPO listing status is currently being contested in the federal courts. The Bald Eagle was proposed for delisting in February 2006 and was officially delisted in July 2007, but is still afforded protection under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. The woundfin (a fish) was added to the federally listed species list for Maricopa County.

Coordination with USFWS and AGFD will be required prior to any type of development (e.g., land use, transportation infrastructure).

Table 3.2 Listed Species Known to Occur within Maricopa and Pinal Counties and Potentially within the Project Study Area

Common Name	Scientific Name	Status				Habitat Considerations	Potential Occurrence in Project Study Area
		USFWS	State	USFS	BLM		
BIRDS							
American Peregine Falcon	*Falco peregrinus anatum*	SC	WSC	S		Prefers areas near rocky cliffs and permanent water sources. Transient.	MODERATE
Bald Eagle	*Haliaeetus leucocephalus*	DL	WSC	S		Large trees or cliffs near water with abundant prey.	MODERATE
Belted Kingfisher	*Ceryle alcyon*		WSC			Transient and winter resident of lakes, ponds and rivers.	LOW TO MODERATE
Black-bellied Whistling-duck	*Dendrocygna autumnalis*		WSC			Prefers low edges of lakes, oxbow ponds, wetlands and slow flowing rivers and creeks. Cottonwood, willow and velvet mesquite are usually favored vegetated areas.	MODERATE
Cactus Ferruginous Pygmy Owl	*Glaucidium brasilianum cactorum*	SC	WSC			Well-vegetated Sonoran desertscrub and adjacent to densely wooded dry washes. Saguaros and large thorny trees (ironwood, paloverde and velvet mesquite are preferred).	MODERATE

Table 3.2 Continued

Common Name	Scientific Name	Status				Habitat Considerations	Potential Occurrence in Project Study Area
		USFWS	State	USFS	BLM		
BIRDS							
California Brown Pelican	*Pelecanus occidentalis californicus*	E				Coastal land and islands; species found around many Arizona lakes and rivers. Uncommon transient in Arizona.	LOW
Common Black-Hawk	*Buteogallus anthracinus*		WSC	S		Riparian obligates associated with perennial drainages with mature gallery forests of broadleaved deciduous trees.	MODERATE
Great Egret	*Ardea alba*		WSC			Lowland riparian areas with hydrophytic emergent vegetation and cottonwood, willow, mesquite and/or tamarisk areas.	MODERATE
Least Bittern	*Ixobrychus exilis*		WSC			Larger marshes with dense, tall growth of emergent vegetation interspersed with water.	MODERATE
Mexican Spotted Owl	*Strix Occidentalis lucida*	T (CH)	WSC	S		El. 4,100 – 9,000 ft. Nests in canyons and generally dense older forests of mixed conifer or ponderosa pine/gambel oak.	LOW
Mississippi Kite	*Ictinia mississippiensis*		WSC			Lowland riparian woodlands; cottonwoods	LOW TO MODERATE
Northern Gray Hawk	*Buteo nitidus maxima*	SC	WSC	S		Riparian woodlands with large trees (cottonwoods), usually near mesquite forests	LOW TO MODERATE
Osprey	*Pandion haliaetus*		WSC			Open bodies of water containing fish. Wetlands and shorelines of ponds, lakes, reservoirs and rivers. Drainages containing ponderosa pine, fir, cottonwood, maple, box elder, alder and willow.	LOW TO MODERATE
Snowy Egret	*Egretta thula*		WSC			Shallow protected backwaters of lakes, rivers, canals or other wetlands with roosting in nearby trees and shrubs.	LOW TO MODERATE
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	E (CH)	WSC	S		Cottonwood/willow and tamarisk vegetation communities along rivers and streams. Distribution in range restricted to riparian corridors.	HIGH

Table 3.2 Continued

Common Name	Scientific Name	Status				Habitat Considerations	Potential Occurrence in Project Study Area
		USFWS	State	USFS	BLM		
BIRDS							
Thick-billed Kingbird	*Tyrannus crassirostris*		WSC			Deciduous riparian woodlands in semi-arid canyons, between 3000 and 6500 feet elevation. Sycamores and cottonwoods, with oak-pine woodland or mesquite grassland communities for breeding sites.	LOW
Tropical Kingbird	*Tyrannus melancholicus*		WSC			Areas with scattered trees, savanna, open woodland, forest edge, plantations, residential areas and agricultural lands. Often nests in cottonwoods and occurs in lowlands near water.	LOW TO MODERATE
Western Burrowing Owl	*Athene cunicularia hypugaea*	SC			S	Variable in open, well-drained grasslands, steppes, deserts, prairies and agricultural lands. Sometimes in open areas such as vacant lots, golf courses and airports.	MODERATE
White Snowy Plover	*Charadrius alexandrinus nivosus*		WSC	S		Sparsely vegetated alkali flats and drying shores of shallow water impoundments. Generally migrants observed along open shorelines, mudflats, sandbars of reservoirs, ponds and/or rivers.	LOW
Western Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	C	WSC	S		Large blocks or riparian woodlands (cottonwood, willow, or tamarisk galleries).	MODERATE
Yuma Clapper Rail	*Rallus longirostris yumanensis*	E	WSC			Freshwater and brackish marshes. Generally associated with dense emergent riparian vegetation. Requires wet substrate with dense herbaceous or woody vegetation for nesting/burrowing.	MODERATE

Table 3.2 Continued

Common Name	Scientific Name	Status				Habitat Considerations	Potential Occurrence in Project Study Area
		USFWS	State	USFS	BLM		
FISH							
Bonytail Chub	*Gila elegans*	E	WSC			Main stream portions of mid-sized to large rivers, usually over mud or rocks. Can utilize ponded or inundated terrestrial habitats.	LOW TO MODERATE
Desert Pupfish	*Cyprinodon macularius*	E (CH)	WSC			Shallow springs, small streams, and marshes. Tolerate saline and warm water.	LOW TO MODERATE
Desert Sucker	*Catostomus clarki*	SC			S	Gila River basin. Found in rapids and flowing pools of streams and rivers.	LOW TO MODERATE
Gila Chub	*Gila intermedia*	E (CH)				Pools, springs, cienegas, and streams.	LOW TO MODERATE
Gila Longfin Dace	*Agosia chrysogaster chrysogaster*	SC			S	Gila River basin. Intermittent hot low-desert streams to clear/cool brooks at higher elevations.	LOW TO MODERATE
Gila Topminnow	*Poeciliopsis occidentalis occidentalis*	E	WSC			Small streams, springs, cienegas and vegetated shallows.	LOW TO MODERATE
Little Colorado Sucker	*Catostomus sp. 3*		WSC	S		Creeks, small to medium rivers and impoundments.	LOW TO MODERATE
Loach Minnow	*Tiaroga cobitis*	T (CH)	WSC	S		Turbulent, rocky riffles of mainstream rivers and tributaries. Swift current velocities and gravel/cobble substrates are preferred.	LOW TO MODERATE
Razorback Sucker	*Xyrauchen texanus*	E (CH)	WSC	S		Riverine and lacustrine areas, generally not in fast moving water and may use backwaters. Found in Horseshoe Reservoir.	LOW TO MODERATE
Roundtail Chub	*Gila robusta*	SC	WSC	S		Cool to warm water, mid-elevation streams and rivers. Known to occur in the mainstem and tributaries of the Verde and Salt Rivers, as well as, canals in metropolitan Phoenix.	LOW TO MODERATE
Sonoran Sucker	Castostomus insignis	SC			S	Gila River basin. Warm water rivers to trout streams.	LOW TO MODERATE
Speckled Dace	Rhinichthys osculus	SC		S		Gila river basin. Bottom dweller in rocky riffles, runs and pools of headwaters, creeks and small to medium rivers.	LOW TO MODERATE

Table 3.2 Continued

Common Name	Scientific Name	Status				Habitat Considerations	Potential Occurrence in Project Study Area
		USFWS	State	USFS	BLM		
FISH							
Woundfin	Plagopterus argentissimus	E	WSC			Freshwater and brackish marshes below 4,500 feet in elevation. Dense emergent vegetation is needed for nesting/foraging. Recently released into Hassayampa River near Wickenburg.	LOW
AMPHIBIANS							
Arizona Toad	*Bufo microscaphus*	SC				Rocky streams and canyons in the pine-oak belt. Also occurs in lower deserts, e.g. Aqua Fria River area.	LOW TO MODERATE
Great Plain Narrow-mouthed Toad	*Gastrophryne olivacea*		WSC			Mesquite semi-desert grassland to oak woodland in close proximity to streams, springs and rain pools.	LOW TO MODERATE
Lowland Burrowing Treefrog	*Pternohyla fodiens*		WSC			Xeric environments, burrowing in low open mesquite grasslands, usually associated with major washes and arroyos.	LOW TO MODERATE
Lowland Leopard Frog	*Rana yavapaiensis*		WSC	S		Aquatic systems in desert grasslands to pinyon juniper.	LOW TO MODERATE
REPTILES							
Banded Gila Monster	*Heloderma suspectum cinctum*	SC		S		Sonoran Desert and extreme western edge of Mohave Desert. Less frequent in desert-grassland and rare in oak woodland. Undulating rocky foothills, bajadas and canyons.	LOW TO MODERATE
Maricopa Leaf-nosed Snake	*Phyllorhynchus brownie lucidus*			S		Inhabitant of the Arizona Upland subdivision of the Sonoran Desertscrub community but it extends into the Lower Colorado River subdivision near Gila Bend and Florence. It is usually found above the flats in foothills and on moderate bajadas	MODERATE
Red-back Whiptail	*Aspidoscelis burti xanthonota*	SC		S		Santank and Sauceda Mts. in Maricopa Co. Canyons and hills in juniper-oak woodlands, down to Sonoran upland desert habitats.	LOW
Giant Spotted Whiptail	*Aspidoscelis burti stictogrammus*	SC		S	S	Inhabits mountain canyons, arroyos, and mesas in arid and semi-arid regions, entering lowland desert along stream courses.	LOW TO MODERATE

Table 3.2 Continued

Common Name	Scientific Name	Status				Habitat Considerations	Potential Occurrence in Project Study Area
		USFWS	State	USFS	BLM		
REPTILES							
Desert Rosy Boa	*Charina trivirgata gracia*	SC		S	S	Rocky areas in desert ranges, especially in canyons with permanent or intermittent streams.	LOW TO MODERATE
Tucson Shovel-nosed Snake	*Chinoactis occipitalis klauberi*				S	Found in arid deserts with sandy washes, dunes and rocky hillsides. Prefer scattered mesquite-creosote bush communities.	MODERATE
Mexican Rosy Boa	*Charina trivirgata trivirgata*	SC			S	Maricopa Mts in Maricopa Co. Rocky mountains or hillsides in desert ranges – granite outcroppings.	LOW
Arizona Skink	*Eumeces gilberti arizonensis*	SC	WSC	S		Documented along riparian habitats along perennial reaches of the Hassayampa River and its tributaries below Wickenburg. Rocks, leaf littler near permanent or semi-permanent streams.	HIGH
Sonoran Desert Tortoise	*Gopherus agassizii*	SC	WSC			Primarily on rocky slopes and bajadas of Sonoran desertscrub. Category 3 habitat identified in study area.	HIGH
Arizona Chuckwalla	*Sauromalus ater*	SC			S	Near cliffs, boulders, or rocky slopes. Rocky desert, lava flows, hillsides and outcrops.	LOW TO MODERATE
Northern Mexican Garter Snake	*Thamnophis eques megalops*	SC	WSC	S		Known from the Agua Fria River and the Verde River. Densely vegetated habitats including cienegas, cienega streams, and stock tanks.	LOW
INVERTEBRATES							
Maricopa Tiger Beetle	*Cicindela oregona maricopa*	SC		S	S	Sandy stream banks and gravels/clays along streambanks. May occur in seeps or reservoir banks.	LOW
Obsolete Viceroy Butterfly	*Limenitis archippus obsolete*			S		Found in association with stands of willow along major water courses. Desert grassland, scrub. Host is genus *Salix*.	LOW TO MODERATE
Squaw Peak Talussnail	*Sonorella allynsmithi*	SC		S		Only known to occur at Squaw Peak Park.	LOW

Table 3.2 Continued

Common Name	Scientific Name	Status				Habitat Considerations	Potential Occurrence in Project Study Area
		USFWS	State	USFS	BLM		
MAMMALS							
California Leaf-nosed Bat	*Macrotus californicus*	SC	WSC			Desert below 4,000 ft. elevation. Caves and tunnels. Sonoran desert scrub.	MODERATE
Cave Myotis	*Myotis velifer*	SC			S	Desert scrub of creosote, brittlebush, paloverde and cacti. Roosts in caves, tunnels and mineshafts and under bridges.	MODERATE
Yuma Myotis	*Myotis yumanensis*	SC				Variety of upland and lowland habitats. Prefers cliffs and rocky walls near water. Can have nursery colonies in buildings, caves, mines and under bridges.	MODERATE
Lesser Long-nosed Bat	*Leptonyceteris curasoae yerbabuenae*	E	WSC	S		Desert scrub habitat with agave and columnar cacti. Day roosts in caves and abandoned tunnels.	MODERATE
Greater Western Bonneted Bat	*Eumops perotis californicus*	SC				Lower and upper Sonoran desertscrub near cliffs, preferring rugged rocky canyons with abundance crevices.	LOW TO MODERATE
Mexican Long-tongued Bat	*Choeronycteris mexicana*	SC	WSC			Mesic areas in canyons of mixed oak-confider forests in moutains rising in the desert.	LOW TO MODERATE
Pale Townsend's Big-eared Bat	*Corynorhinus townsendii pallescens*	SC				Day roosts in caves and mines from desertscrub up to woodlands and conifer forests.	LOW TO MODERATE
Pocketed Free-tailed Bat	*Nyctinomops femorosaccus*				S	Arid lower elevations usually around high cliffs and rugges rock outcrops.	LOW TO MODERATE
Sonoran Pronghorn	*Antilocapra Americana sonoriensis*	E	WSC	S		Broad intermountain alluvial valleys with creosote-bursage and paloverde-mixed cacti associations.	LOW TO MODERATE
Western Red Bat	*Lasiurus blossevillii*		WSC			Riparian and other wooded areas. Generally roosts in trees.	LOW TO MODERATE
Western Yellow Bat	*Lasiurus xanthinus*		WSC			May be associated with Washingtonian fan palm, other palms or sycamores, hackberries and cottonwoods.	LOW

Table 3.2 Continued

Common Name	Scientific Name	Status				Habitat Considerations	Potential Occurrence in Project Study Area
		USFWS	State	USFS	BLM		
PLANTS							
Acuna Cactus	*Echinomastus erectocentrus* var. *acunensis*	C	HS			Well-drained knolls and gravel ridges between major washes; granite soils in Sonoran desert scrub association.	LOW
Arizona Agave	*Agave arizonica*	E (DL)	HS			El. 3,000-6,000 ft. Transition zone between oak-juniper woodland and mountain mahogany-oak scrub.	LOW
Arizona Cliffrose	*Purshia subintegra*	E	HS			White soils of tertiary limestone lakebed deposits.	LOW
Arizona Rosewood	*Vauquelinia califonica* ssp. *sonorensis*				S	Desertscrub and desert grassland, in woodland or forest at base of cliffs, along canyon bottoms and on moderate to steep slopes.	LOW
Bigelow Onion	*Allium bigelovii*		SR			Gentle slopes from 2,000 – 5,000 ft elevation. Open, dry rocky soil in grassland and open chaparral, and desert scrub.	LOW
California Barrel Cactus	*Ferocactus cylindraceus* var. *cylindraceus*		SR			Gravelly or rocky hillsides, canyon walls, alluvial fans, and wash margins. Known to occur in the White Mountains, Maricopa Co.	LOW TO MODERATE
Emory's Barrel-Cactus	*Ferocactus emoryi*		SR			(None Noted.)	LOW TO MODERATE
Flannel Bush	*Fremontodendron californicum*		SR		S	Known to occur within the Four Peaks-Mazatzal Mts. and Superstition Mts. in Maricopa Co. Dry, north slopes in canyons. Well-drained rocky hillsides and ridges.	LOW
Fish Creek Fleabane	*Erigeron piscaticus*	SC	SR	S	S	Total range in Maricopa County: Fish Creek Canyon, Superstition Mts. Moist, sandy canyon bottoms associated with perennial streams.	LOW
Fish Creek Rock Daisy	*Perityle saxicola*	SC		S		Found in Gila and Maricopa Cos. Near Tonto National Monument, Roosevelt Lake, above Horse Camp Creek (Sierra Ancha Mts.). Xeric habitat on very steep slopes.	LOW
Golden Barrel Cactus	*Ferocactus cylindraceus* var. *eastwoodiae*		SR			(None noted.)	LOW TO MODERATE

Table 3.2 Continued

Common Name	Scientific Name	Status				Habitat Considerations	Potential Occurrence in Project Study Area
		USFWS	State	USFS	BLM		
PLANTS							
Hohokam Agave	*Agave murpheyi*	SC	HS	S	S	Verde River drainage, Bradshaw, McDowell, New River and Wickenburg Mts. Benches or alluvial terraces on gentle bajada slopes above major drainages in desert scrub.	LOW
Kofa Barberry	*Barberis harrisoniana*				S	Sand Tank Mts. Bottoms of deep, shady rocky canyons.	LOW
Organ Pipe Cactus	*Stenocereus thurberi*		SR		S	Sonoran desert; adjacent to thorn forests mostly on hills and bajadas.	LOW
Pima Indian Mallow	*Abutilon parishii*	SC	SR	S		Superstition Mts. Mesic situations in full sun with higher elevation Sonoran desert scrub.	LOW
Ripley Wild-buckwheat	*Eriogonum ripleyi*	SC	SR	S		Near Horseshoe Lake and Chalk Mountain, Maricopa Co. Tertiary lakebeds on well-drained powdery soils derived from limestone, sandstone or volcanic tuffs/ashes.	LOW
Straw-top Cholla	*Opuntia echinocarpa*		SR			Flats, slopes and washes.	MODERATE
Cactus Apple	*Opuntia engelmannii* var. *flavispina*		SR			May occur up to 2,500 ft. elevation in sandy bajadas.	MODERATE
Sweet Acacia	*Acacia farnesiana*			S		Rarely grows in the wild. El. 2,500 to 4,000.	LOW
Tonto Basin Agave	*Agave delamateri*	SC	HS	S		Mazatzal Mts near Sunflower. Usually found atop benches, at edges of slopes, on open hilly slopes in desert scrub, overlooking major drainages and perennial streams. 2,190–5,100 ft. Elevation.	LOW
Tourmey Agave	*Agave toumeyana* var. *bella*		SR			4,000–5,000 ft. elevation. Rocky slopes in chaparral.	LOW
Tumamoc Globeberry	*Tumamoca macdougalii*		SR	S	S	Xeric situations, in the shade of a variety of nurse plants along gullies and sandy washes of hills and valleys in Sonoran desert scrub.	LOW TO MODERATE

Table 3.2 Continued

Common Name	Scientific Name	Status				Habitat Considerations	Potential Occurrence in Project Study Area
		USFWS	State	USFS	BLM		
PLANTS							
Varied Fishhook Cactus	*Mammillaria viridiflora*		SR			Semidesert grasslands, interior chaparral, pinyon-juniper and oak woodlands, crevices, boulders, canyon sides and gravelly igneous substrates from 4,600-6,600 ft. elevation.	LOW
Zuni Fleabane	*Erigeron rhizomatus*	T				Found in Elevation 7,600–7,700 ft. pinyon-juniper woodlands	LOW

Notes: **E** = Endangered **T** = Threatened **PDL =** Proposed for Delisting **DL** = Delisted
C = Candidate Species **CH** = Designated Critical Habitat **SC** = Species of Concern

WSC = Wildlife of Special Concern **HS =** Highly Safeguarded **SR =** Salvage Restricted
ER = Export Restricted **SA** = Salvage Assessed
HR = Harvest Restricted **S =** Sensitive Plants

Sources: USFWS. Species list for Maricopa County. Accessed from http://www.fws.gov/arizonaes/Threatened.htm#CountyList. August 10,, 2007.
USFWS. Species list for Pinal County. Accessed from http://www.fws.gov/arizonaes/Threatened.htm#CountyList. August 10, 2007.
AGFD. Species in the Arizona HDMS. June 28, 2007. Accessed from http://www.azgfd.gov/w_c/edits/hdms_species_lists.shtml.
AGFD. Special Status Species for Interstate 10/Hassayampa Valley Transportation Framework Study. July 28, 2006.

Figure 3-10 provides a summary of the habitat areas known to occur in the study area for the Sonoran desert tortoise and the pygmy owl survey zones. The figure also indicates the known habitat areas for the lesser long-nosed bat. The lesser long-nosed bat habitat in the study area is primarily concentrated east of SR-85. Desert tortoise habitats are generally concentrated in the areas surrounding mountain ranges. There is no designated critical habitat located within the study area.

3.2.4 Wildlife Linkages

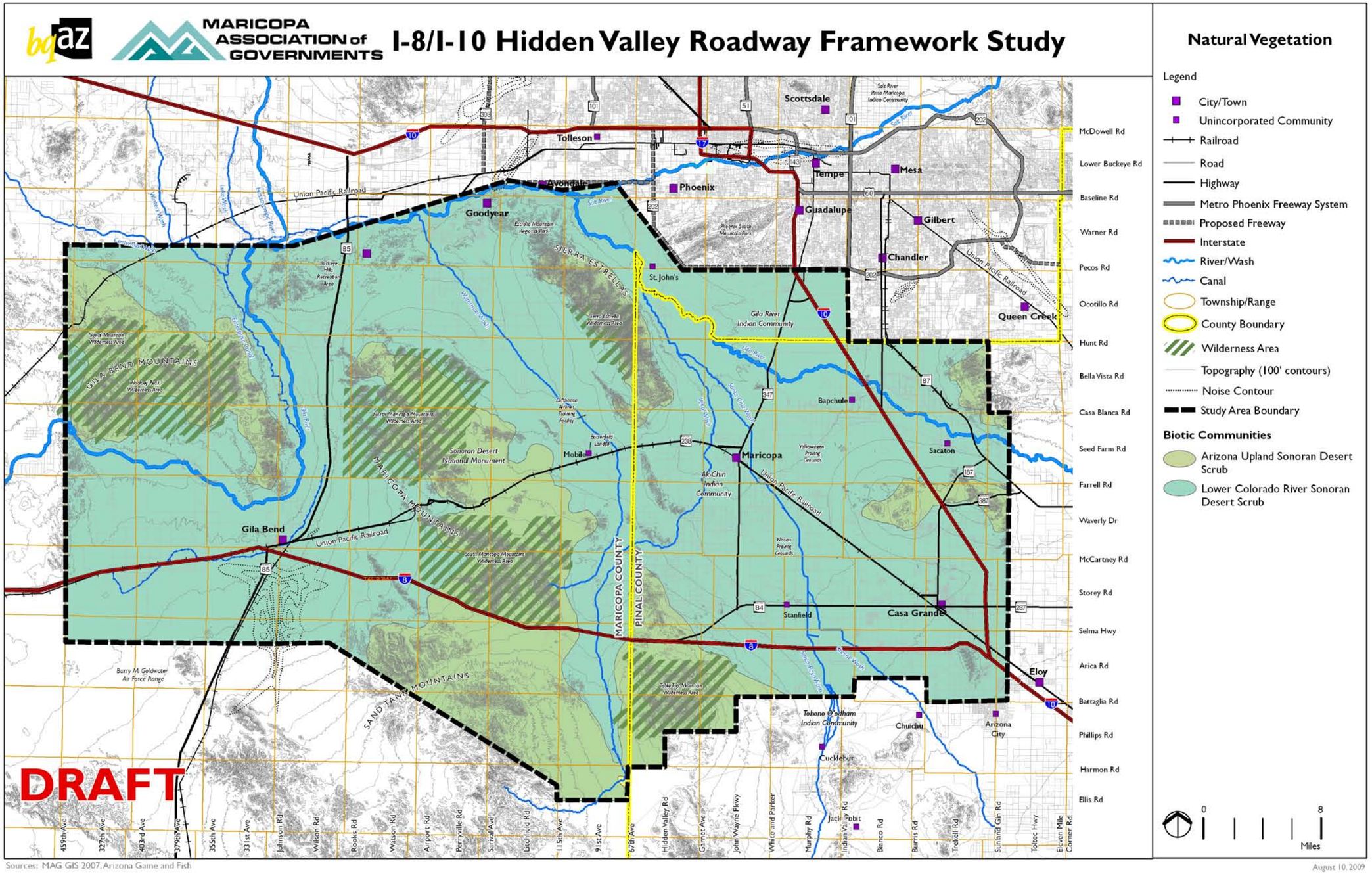
The Arizona Wildlife Linkages Workgroup, a partnership of public and non-governmental agencies, recently completed *Arizona's Wildlife Linkages Assessment*. The assessment documented and mapped initial efforts to identify habitat blocks, fracture zones, and potential linkage zones in an effort to promote wildlife habitat connectivity for Arizona's wildlife. The assessment is intended to provide a framework for land managers and planners to assess opportunities for mitigation, such as wildlife crossings, land protection measures, and community planning.

Habitat blocks are areas of land that consist of important wildlife habitat and can reasonably be expected to remain wild for at least 50 years. These habitat blocks are mainly composed of publicly owned or managed lands within areas such as national forests, national parks, national wildlife refuges, large military reservations, tribal lands, and lands managed by the BLM or Bureau of Reclamation. Habitat blocks also include private lands that are managed for conservation by organizations such as The Nature Conservancy, as well as some ranches that are committed to long-term conservation.

Fracture zones are areas between habitat blocks that provide barriers or challenges to wildlife connectivity. These regions are largely State Trust land, private holdings and transportation corridors. Roads, canals, urban areas, railroads and border security operations limit or prevent animal movement, or threaten to do so, in these zones. These fracture zones generally need some sort of restoration to function as reliable wildlife linkages.

Potential linkage zones are a portion or subset of the fracture zone or habitat block, identified as areas critical to wildlife movement and connectivity. Threats must be managed if connectivity is to be maintained or restored.

Figure 3-10 Biological Resources



The potential linkage zones were identified and prioritized based on a ranking of habitat quality, threats to wildlife movement, and opportunities for such movement. Factors used to evaluate and prioritize linkage zones are:

- Threats (e.g. highways, urbanization, canals, railroads)
- Opportunities (e.g. cross-border jurisdictional cooperation, projects that are conducive to the inclusion of mitigation measures)
- Habitat quality
- Presence of linkage-dependent species
- Ability to facilitate seasonal migration
- Location in a riparian area
- Conservation ownership

Figure 3-11 depicts the results of this study, illustrating habitat blocks, potential linkage zones, and fracture zones. Habitat blocks in the study area are located in the Indian communities, Sonoran Desert National Monument, the wilderness areas, and the area surrounding the two Maricopa County regional parks. Except for the Indian communities and the regional parks, these habitat blocks are managed by the BLM. The potential linkage zones connect the habitat blocks: notably along the Gila River; I-8 between the Sand Tank Mountains and the South Maricopa Mountains Wilderness Area; between the Gila Bend Mountains, the Sonoran Desert National Monument and the Sierra Estrella Wilderness Area; and along a portion of SR-238 through the national monument. The potential linkage zones are outlined below:

- Linkage Zone 68 Saddle Mountain-Gila Bend Mountains
- Linkage Zone 72 Sentinel Plain
- Linkage Zone 73 Gila Bend Mountains-North Maricopa Mountains
- Linkage Zone 74 North Maricopa Mountains – Sierra Estrella Mountains
- Linkage Zone 76 South Maricopa Mountains – Sand Tanks
- Linkage Zone 126 Bunyon Peak – Painted Rock Mountains
- Linkage Zone 127 Margies Peak – Sheep Mountain
- Linkage Zone 128 North Maricopa Mountains – South Maricopa Mountains
- Linkage Zone 148 Round Butte – Javelina Mountain
- Linkage Zone 150 Little Table Top – Vekol Mountains
- Linkage Zone 151 Gila/Salt River Corridor: Granite Reef Dam – Gillespie Dam

Potential Linkage Zone 72 linking the Gila Bend area to the Yuma area, as identified in the study, is considered a "highest priority" zone, with such threats as border security installations, canals, I-8, the Union Pacific Railroad (UPRR) and urbanization.

The *Wildlife Linkages Assessment* is designed to expand public awareness of the necessity of preserving wildlife linkages. To integrate wildlife habitat connectivity needs into statewide conservation and transportation planning, further refinement of the assessment is required. The Arizona Wildlife Linkages Workgroup will oversee these efforts and will begin building cooperative relationships with other partners, such as land trusts, Indian communities, other federal and state landholders, other conservation organizations, special interest groups, and the public. These relationships will be important in implementing linkage designs and in designing appropriate mitigation for transportation projects that affect wildlife movement. Input by resource stakeholders addressing critical wildlife habitat needs should occur in the early stages of project development, while opportunities still exist for either land acquisition or construction of permeable passages or structures for wildlife.

3.2.5 Cultural Resources

Cultural resources are defined as prehistoric and historic archaeological sites or objects, historically or architecturally significant structures or landscapes, and traditional cultural places that may be considered eligible or potentially eligible for the National Register of Historic Places (NRHP). The NRHP is the nation's official list of cultural resources worthy of preservation. Under the National Historic Preservation Act (NHPA) of 1966, the National Register lists districts, sites, buildings, structures, and objects that are significant in American history, architecture, archaeology, engineering, and culture. Figure 3-12 shows known cultural resources in the study area.

Figure 3-11 Wildlife Linkages

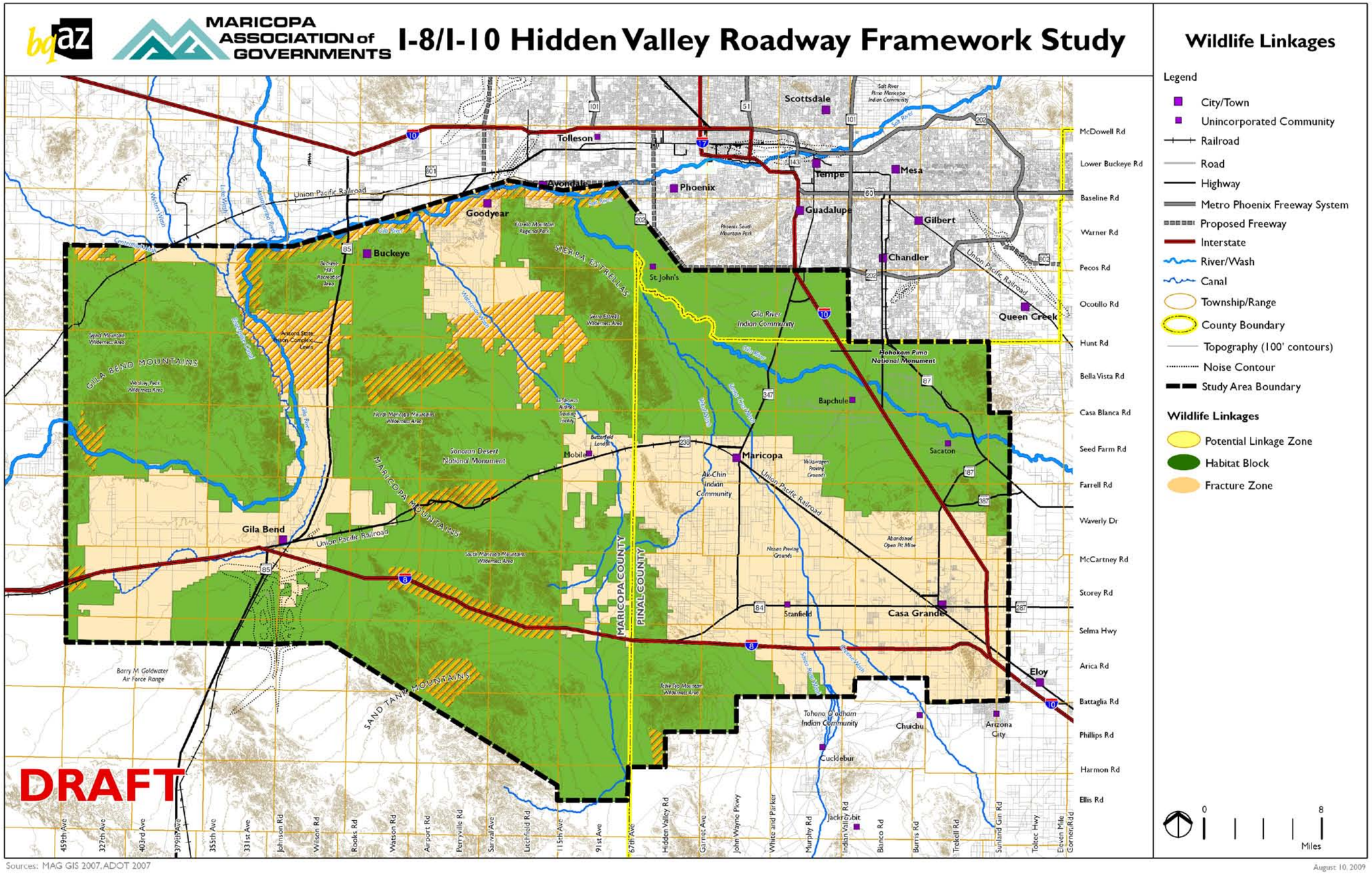
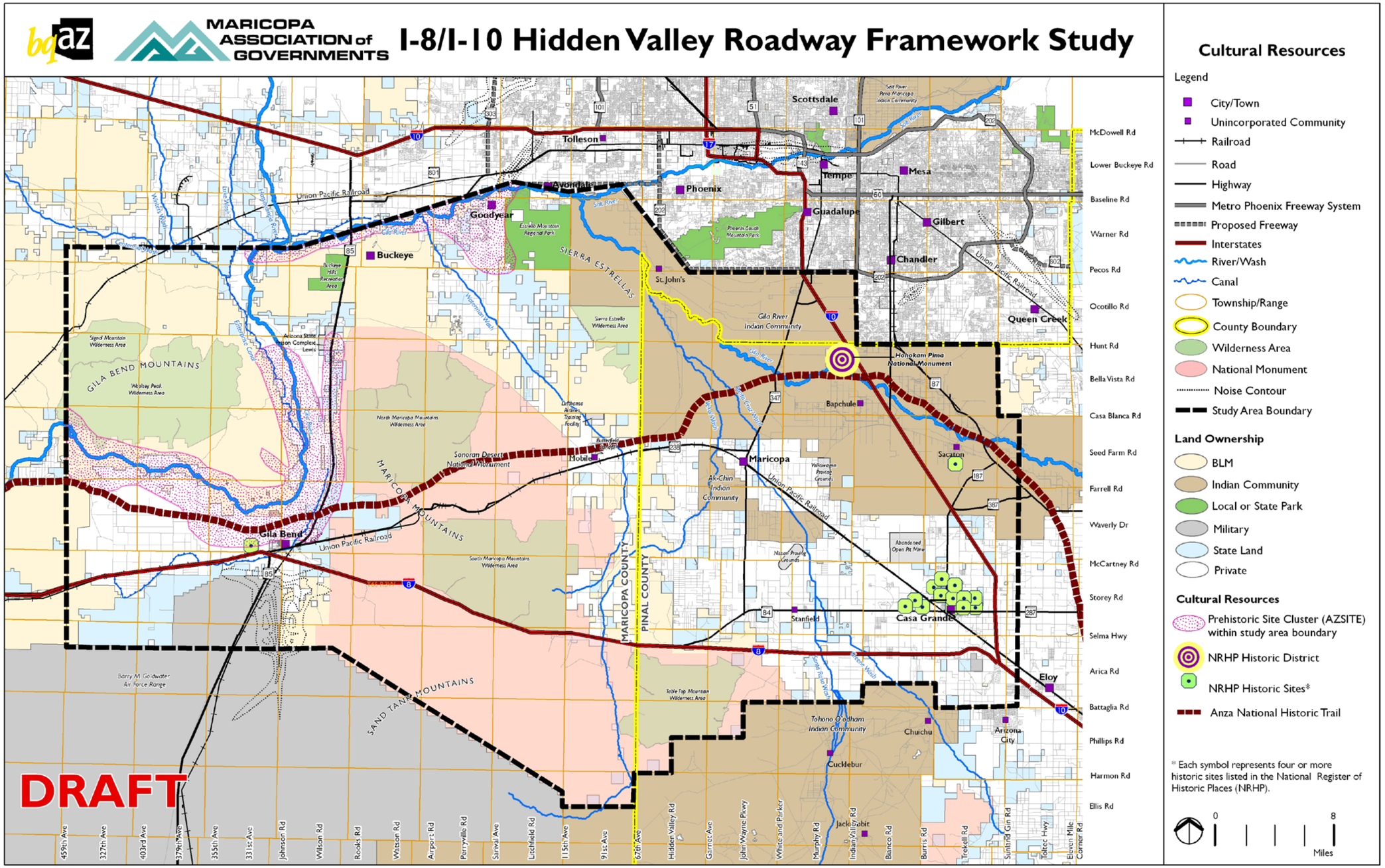


Figure 3-12 Cultural Resources



Prehistory and History

The earliest known prehistoric groups in Arizona were the Paleo-Indian big game hunters (12,000–7,500 B.C.) who followed the big game herds. There is evidence of this activity in large kill sites associated with the fluted Clovis and Folsom projectile points. The Archaic culture followed (7,500 B.C.–A.D. 1). They started out as hunters and gatherers moving around seasonally to hunt for deer and rabbit, gathering wild fruits and seeds. They lived in temporary sites and made stone tools. Around 1,000 B.C., they began domesticating plants and producing grinding implements and baskets. The Hohoham culture emerged from the Archaic period (ca. A.D. 1–700) living in small groups of shallow pit houses. They cultivated corn and squash and began producing ceramics, which led to a more sedentary agricultural lifestyle. By ca. A.D. 700 they were living in villages with irrigation and canals. As the canal systems expanded, the population grew, the village size increased, and trading occurred throughout modern day Arizona and Mexico. Platform mounds, plazas, and ballcourts became more numerous by A.D. 1150. As new populations came into the area, the villages became larger, but there were fewer of them and ballcourts were no longer being constructed. Between A.D. 1350 and 1450, they lived in small groups of pit houses constructed on top of the earlier platform mounds.

The O'odham (Pima and Papago) and the Maricopa were present in the area where the Hohokam had lived, starting around A.D. 1450 and continuing through the historic period when the Spanish came into Arizona in the early 1530s. Friar Marcos de Niza and the slave Esteban came north from Mexico in 1539, followed by Francisco Vasquez de Coronado in 1540–1542. In 1821, Mexico gained its independence from Spain. The Americans won the Mexican-American War in 1848 and in 1853 the Gadsden Purchase was signed, which resulted in the acquisition of southwestern New Mexico and southern Arizona. This opened up the area to the military and mining. Arizona was organized as a territory in 1863 and became a state in 1912. During the early 20th century, Arizona developed an economy based on ranching, farming, mining, and homesteading.

Archival Research

Research was conducted at the Arizona State Museum – AZSITE, Arizona Archaeological Site and Survey Database, which is the repository of sites of cultural and archaeological significance in Arizona under the Arizona Antiquities Act. This act calls for a cultural resources survey and the identification of any physical evidence of past human activity before any ground-disturbing activity, such as archaeological research or development, can be carried out on state lands. AZSITE includes cultural resource survey and data recovery reports, and prehistoric and historic site information.

Many cultural resource investigations (surveys, monitoring, testing, and data recovery) have occurred in the region. Many projects are associated with linear transportation (state, county, and municipalities), linear utility corridors (gas and electric transmission lines), private and commercial development, planning corridor studies, and state and federal projects. (Cultural resource project and site information on tribal lands is considered restricted information, and is therefore available only through the individual tribes).

Historic Sites

The historic cultural resources identified in the study area include one historic district and sixty-six historic structures that are NRHP-eligible, as well as the Anza National Historic Trail. The latter, officially designated as the Juan Bautista de Anza National Historic Trail, is a passive recreational corridor of considerable cultural and historic significance, as it was the first overland route connecting Sonora, Mexico to San Francisco, California in 1776. The trail enters the study area (from the north) just south of the Gila River, goes through the Sonoran Desert National Monument and traverses Mobile. In Pinal County, the trail cuts through the GRIC, crosses the Hohokam Pima National Monument while generally following the Gila River, and exits southwards toward Eloy and Picacho.

The NRHP Historic District of the Hohokam Pima National Monument, located within the Gila River Indian Community, covers an area of 16,900 acres, has nine structures and is federally-owned. This national monument was authorized by the Congress in 1972 to protect the Hohokam village known today as "Snaketown" and is not open to the public. Excavations in 1934 revealed that this site was inhabited from about 300 B.C. to 1200 A.D.

Prehistoric Sites

Prehistoric archaeological sites are not identified on Figure 3-12, because the specific locations of archaeological sites are protected by federal and state laws to prevent vandalism of these resources. However, general clustering of prehistoric sites have been depicted on the map. The majority of the larger prehistoric sites within the study area are located along the Gila River, where the Hohokam irrigation system originated. The Hohokam were sedentary agriculturalists who relied on irrigation for their crops and lived in villages close to the river and their canal system. While this clustering of sites is not indicated on the map within the Gila River Indian Community (due to tribal restriction of cultural resources data), almost certainly the prehistoric Hohokam sites were consistently present along the whole of the Gila River. Archaeological prehistoric sites are also present outside the Gila River corridor clusters. These sites would consist of smaller habitation sites that were not as dense as those along the river, as well as sherd and lithic scatters.

Regulatory Compliance

Cultural resources are protected by various local, state, federal, and tribal laws and need to be considered in the planning and design phases of community and infrastructure development. The regulatory compliance required for cultural resources, which depends on land jurisdiction and funding, may include Section 106 of the NHPA for federal projects, the Archaeological Resources Protection Acts for federal lands (i.e., BLM, USFS), the Arizona Antiquities Act for state projects, and the National American Graves Protection and Repatriation Act for tribal lands.

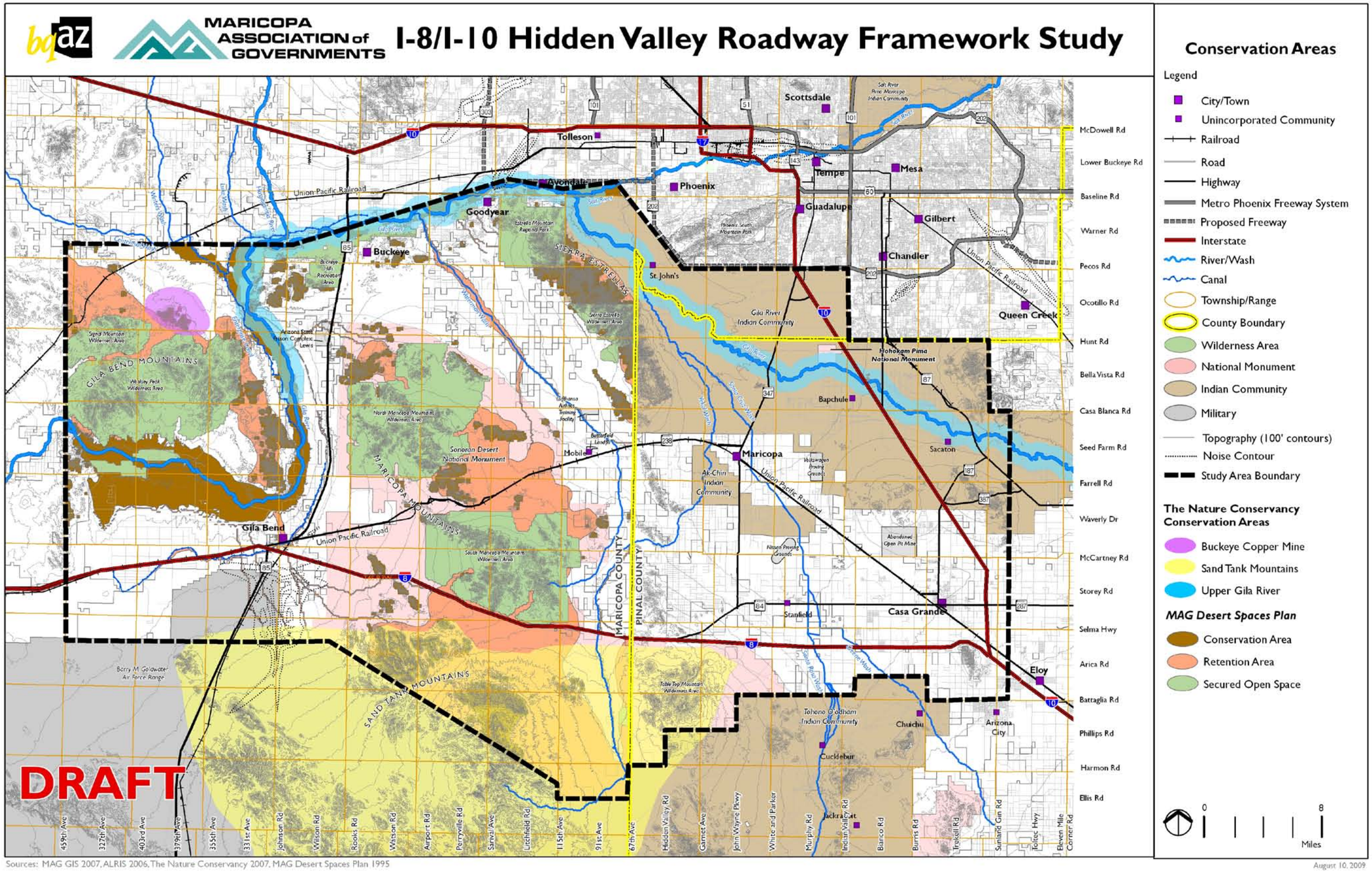
3.2.6 Conservation Areas

Figure 3-13 shows existing conservation areas. The Nature Conservancy (TNC) developed a conservation framework of ecoregional assessments in 1995 to guide development of a blueprint for regional conservation efforts. Ecoregions are large units of land and water that share similar climate, topography, and biological communities (TNC, 2005). There are six ecoregions in the southwestern United States and northwestern Mexico. The Hidden Valley study area lies completely within the Sonoran Desert Ecoregion. These ecoregions have been analyzed to identify conservation areas that include species and natural communities representative of their biodiversity. The basic unit of analysis to identify a network of conservation areas is the conservation element (also known as conservation target), which consists of species and natural communities representative of the ecoregion. Thus, conservation areas represent focal landscapes for developing public awareness and implementing conservation actions to ensure that conservation elements remain viable on the landscape. Conservation planning within any one of the conservation areas identified in the entire ecoregion can be significantly enhanced by the addition of fine-scale data. This implies that if planning is being done at a smaller scale, such as for the Sonoran Desert National Monument, conservation area boundaries identified at an ecoregional scale often need to be adjusted. Most of these areas are managed by federal and state public agencies, with the BLM managing the most land.

There are three TNC conservation areas in the study area: Buckeye Copper Mine, just north of the Gila Bend Mountains; Upper Gila River, which follows the Gila River from its confluence with the Enterprise Canal to the eastern study area boundary; and the Sand Tank Mountains, which cover the Sand Tank Mountains and Table Top Mountain Wilderness Area in the southern part of the study area. These conservation areas can be ranked with reference to a particular wildlife, riparian or species system.

Many threats and stresses have been identified that affect conservation areas. Human activities, such as introduction of non-native species, recreation, mining, urban development, improper livestock management, groundwater extraction, conversion of desert vegetation to agriculture, and alteration of natural fire regimes, impose major and widespread stresses on native biodiversity. Planning activities in these areas should conform to the larger goals of the conservation management plans and aim at closer coordination with concerned agencies such as BLM, USFS, and the Sonoran Institute. These agencies are charged with ensuring that permitted activities maintain or restore the natural ecological processes and support the continued persistence of native biodiversity. The Sonoran Institute recommends a community-based approach to conservation, whereby federal land managers can more effectively engage the public in the planning process by understanding the values, interests and concerns of local communities. At the state level, AGFD maintains a database of species of concern, their ecological status, and habitats, to promote sound environmental planning and conservation measures.

Figure 3-13 Conservation Areas



The Maricopa Association of Governments (MAG) Desert Open Spaces Plan identifies and recommends strategies for natural resources and open spaces critical to the quality of life in Maricopa County. The main objective of this plan is to preserve, protect and enhance mountains, rivers and washes, canals and cultural sites, upland vegetation, wildlife habitat, and existing parks and preserves. The plan identifies secured open spaces that correspond to regionally significant mountains, rivers, washes and upland desert. In the Hidden Valley study area, this category includes the Signal Mountain Wilderness Area, Woolsey Peak Wilderness Area, the Gila Bend Mountains, Buckeye Hills Recreation Area, Estrella Mountain Regional Park, Sierra Estrella Wilderness Area, Sierra Estrella Mountains, North Maricopa Mountains Wilderness Area, South Maricopa Mountains Wilderness Area, and Maricopa Mountains; and the Gila River.

In addition, the plan identifies two types of open space management categories, retention and conservation. Conservation areas, as identified by this plan, cover those resources that are the most fragile and important with exceptional scenic value, containing riparian or wildlife habitats and valuable cultural resources. Policies in these areas prohibit all types of development and allow recreational use only if the quality of the resources is not degraded. Retention areas cover resources of the upland Sonoran desert and the hillsides. Only environmentally sensitive development is recommended for retention areas; emphasis is placed on maintaining the integrity of the undeveloped hillsides, native vegetation, wildlife diversity, and archaeological and historic sites. Within the study area, retention resources have been identified around the Gila Bend Mountains, Sonoran Desert National Monument and Sierra Estrella Mountains.

3.2.7 Recreational Opportunities

Figure 3-14 depicts recreational opportunities in the Hidden Valley study area. A review of the Maricopa County Trails Plan and the draft Pinal County Open Space and Trails Master Plan found several trails and municipal open spaces within the study area. The map displays local parks and open spaces, and various trail corridors.

The 1,521 miles of the Maricopa County Regional Trail System are organized into priorities to serve as a guide while implementing the trail system plan. The only Priority 1 segment within the study area travels along the northern boundary of the area from Buckeye Hills Recreation Area into Phoenix South Mountain Park. This is part of the Sun Circle Trail and the Maricopa Trail, which are primary trails of Priority Level 1 that connect all the regional parks in the Maricopa County park system. The Priority 2 segments are important regional corridors that connect to the Maricopa Trail and may provide connections to regional park systems. There is a small Priority 2 segment within the study area, from the confluence of Hassayampa and Gila Rivers to the Priority 1 segment at Buckeye Hills Recreation Area. Priority 3 segments are regional corridors that are not key components of the regional trail system at this time, but may become important future trails. There are no such segments within the study area. Priority 4 trails are conceptual corridors in the outlying areas of the county. There are several Priority 4 segments within the study area, with the longest one cutting across the middle, from just south of the Gila River all the way across the Sonoran Desert National Monument into Pinal County.

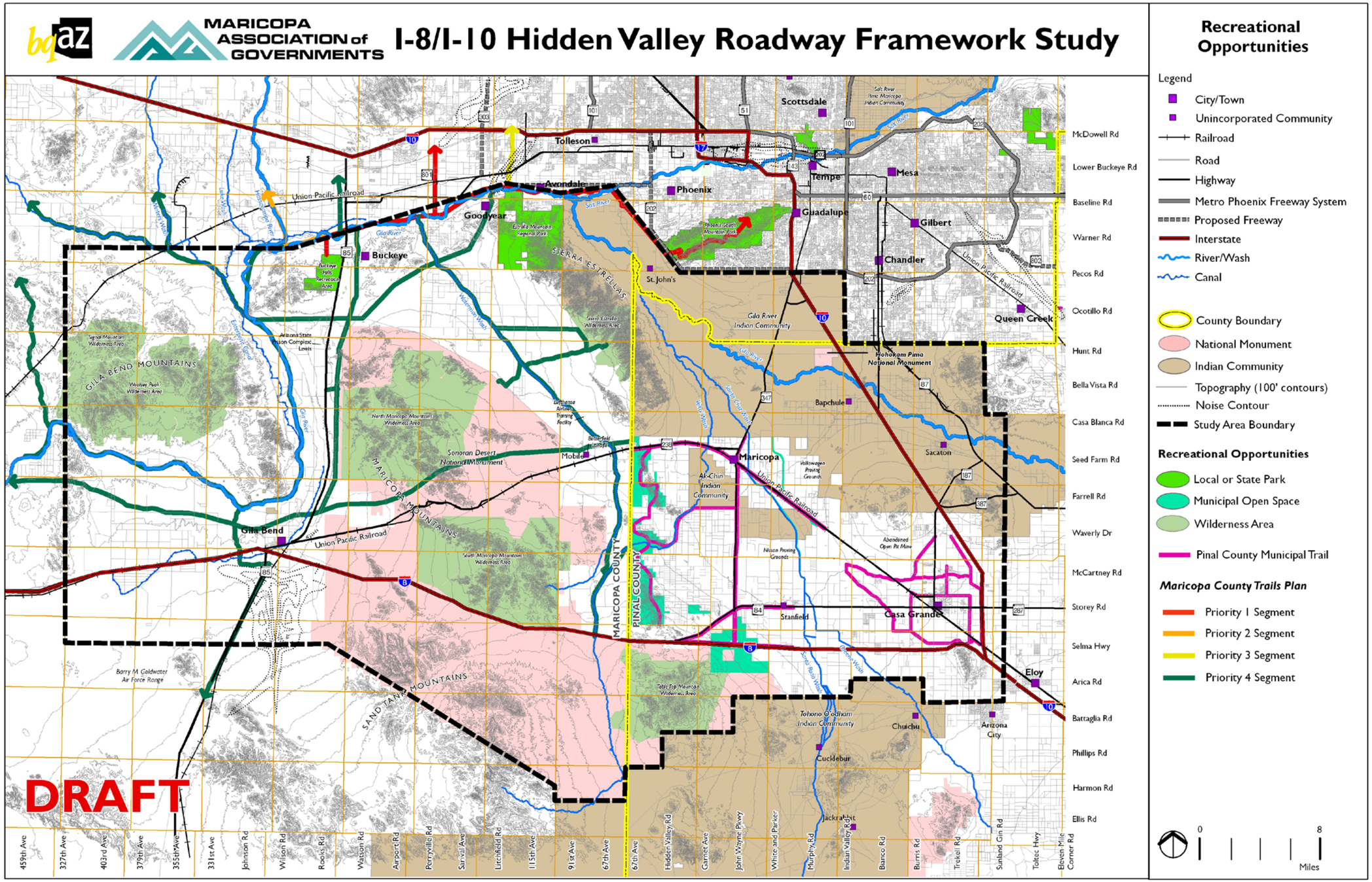
In Pinal County, several municipal trails exist in Casa Grande and around the Ak-Chin Indian Community. Buckeye Hills Recreation Area and Estrella Mountain Regional Park are regional parks maintained by the Maricopa County Parks and Recreation Department. Among other protected open spaces, six wilderness areas are managed by the BLM, with five of them in Maricopa County. Human activities in wilderness areas are restricted to scientific study and non-mechanized recreation; horses are permitted but motorized vehicles and bicycles are not. These wilderness areas offer a variety of recreation opportunities like rock climbing, day and overnight hiking, rock collecting, and deer and quail hunting.

The city of Maricopa completed its *Parks, Trails and Open Space Master Plan* in 2008. The plan identifies existing recreational facilities and future needs throughout the city.

Section 4(f) and 6(f) Properties

Section 4(f) refers to an original section of the U.S. Department of Transportation (USDOT) Act of 1966 and applies to all agencies within that department. The Section 4(f) requirement, originally set forth in 49 United States Code (USC) 1653(f), requires the consideration in transportation project development of the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge, or land of a historic site of national, state, or local significance (as determined by the federal, state, or local officials having jurisdiction over the park, recreation area, refuge, or site). Historic sites are afforded protection under Section 4(f) if listed or determined eligible for the NRHP. The law is codified in 49 USC 303 and 23 USC 138. USDOT may not approve an action requiring the use of a Section 4(f) protected property, unless it is determined that: 1) there is no feasible and prudent alternative to the use of land from the property, and 2) the action includes all possible planning to minimize harm to the property resulting from such use.

Figure 3-14 Recreational Opportunities



Sources: MAG GIS 2007, ALRIS 2006, Maricopa County Regional Trail System Plan 2004

August 10, 2009

The Section 4(f) evaluation is prepared to provide data on Section 4(f) properties and information to determine possible feasible and prudent alternatives that avoid the use of these resources. A Section 4(f) "use" occurs when:

- Land from a Section 4(f) property is acquired for a transportation project--referred to as a "direct taking"—or,
- The proximity impacts of the transportation project on the Section 4(f) property, without acquisition of land, are so great that the purposes for which the Section 4(f) property exists are substantially impaired. This circumstance is known as "constructive use."

Public schools are considered Section 4(f) resources if public access to, or use of, school playgrounds and sports facilities on these properties is impacted. Within the study area, 25 schools exist, with most of them concentrated in downtown Casa Grande and in the GRIC, especially along the Gila River. One or more schools are also found in the communities of Gila Bend, Mobile, Maricopa and Stanfield. If any transportation corridors are proposed near these schools, it should be determined whether the schools in question are eligible 4(f) resources; if so, all possible planning efforts must be made to minimize the impacts of any project on these resources. There are no wildlife or waterfowl refuges in the study area.

A number of public parks are located within the study area. Most of them are found in downtown Casa Grande, GRIC, and the communities of Buckeye and Goodyear. This category also includes the two regional parks (Buckeye Hills Recreation Area and Estrella Mountain Regional Park), and campsites in the Sonoran Desert National Monument. Sixty-six NRHP-eligible historic structures and the Historic District of the Hohokam Pima National Monument are protected under Section 4(f). Figure 3-15 shows the potential Section 4(f)/6(f) properties within the study area.

Section 6(f) of the 1965 Land and Water Conservation Fund Act provides funding for acquiring property and developing public recreational facilities, and also protects against the loss of that property to other uses. This section of the Act states that "no property acquired or developed with assistance under this section shall, without the approval of the Secretary, be converted to other than public outdoor recreation uses." Section 6(f) applies when a project acquires property where Land and Conservation Funds have been used to either acquire or develop the property. Section 6(f) prohibits the conversion of property acquired or developed with these grants to a non-recreational purpose without the approval of the Department of the Interior, National Park Service. Section 6(f) directs the Park Service to assure that replacement lands of equal value, location and usefulness are provided as a condition for approving such conversion.

Table 3.3 lists the parks that have received funding from Land and Water Conservation funds and are therefore protected under Section 6(f) of the Land and Water Conservation Act.

Table 3.3 Projects Funded by the Land and Water Conservation Funds/Section 6(f) Resources in the Study Area

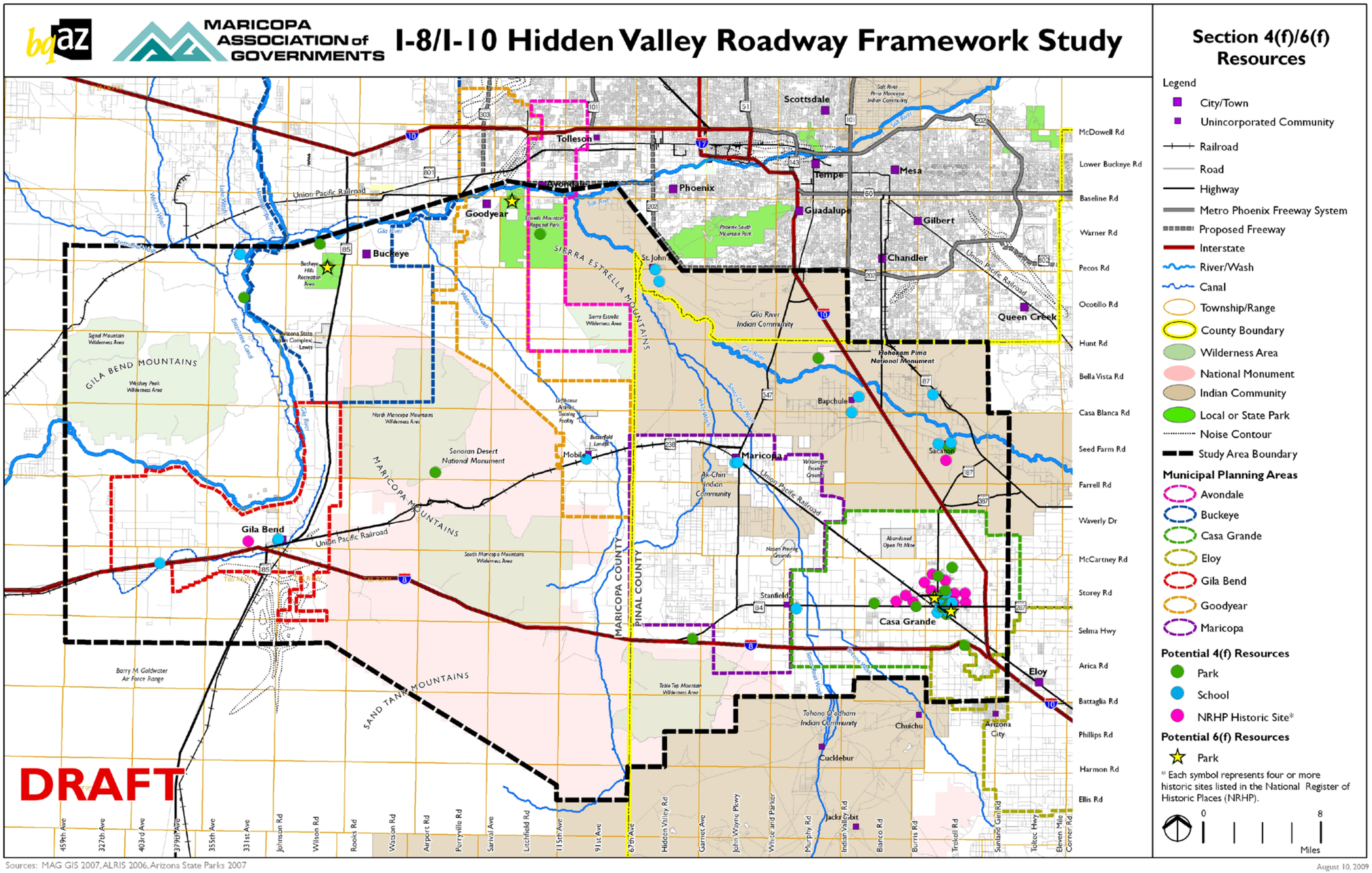
Grant Recipient	Park	Year	Award	Total Project Cost
Maricopa County	Casey Abbott Recreational Area/Semi-Regional Park (Goodyear)	1970	$65,983	$131,953
Maricopa County	Buckeye Hills Recreation Area (Buckeye)	1971	$48,932	$97,865
Maricopa County	Buckeye Hills Recreation Area (Buckeye)	1972	$3,626	$7,253
Casa Grande	Westside Park Development (Casa Grande)	1980	$16,475	$32,950
Casa Grande	Mosley Park Development (Casa Grande)	1980	$23,500	$47,000

Source: Appendix A, 2003 Statewide Comprehensive Outdoor Recreation Plan (SCORP), Arizona State Parks

3.2.8 Air Quality

Under the Clean Air Act (CAA), the U.S. Environmental Protection Agency (EPA) has established air quality standards to protect public health and the environment. EPA has set national ambient air quality standards (NAAQS) for the six primary air pollutants: carbon monoxide (CO), lead, nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$) and sulfur dioxide (SO_2). Arizona has adopted the federal NAAQS as the state Ambient Air Quality standards as well. Table 3.4 lists the primary and secondary national standards for each criteria pollutant.

Figure 3-15 Section 4(f)/6(f) Resources



EPA designates an area as non-attainment if it has violated, or has contributed to violations of, the NAAQS over a three-year period. If an area is designated as non-attainment, the CAA requires the state, local and tribal governments to develop and produce a State Implementation Plan (SIP) to reduce emissions of the pollutants that exceed federal standards. A SIP is an enforceable plan developed at the state and local level that explains how the area will comply with air quality standards according to the CAA. The SIP is the cumulative record of all air pollution control strategies, state statutes, state and local rules, and local ordinances implemented under Title I of the CAA by governmental agencies in the state.

Table 3.4 National (EPA) Ambient Air Quality Standards (NAAQS)

Pollutant	National (EPA)	
	Primary	Secondary
Particulates		
PM_{10}		
Annual Average [1]	Revoked	---
24-hour Average [2]	150 μg/m³	---
$PM_{2.5}$		
Annual Average [3]	15.0 μg/m³	Same as Primary
24-hour Average [4]	35 μg/m³	---
Lead		
Quarterly Average	1.5 μg/m³	Same as Primary
Sulfur Oxides (SO_x)		
Annual Average	0.03 ppm	---
24-hour Average [5]	0.14 ppm	---
3-hour Average [5]	---	0.5 ppm
Carbon Monoxide (CO)		
8-hour Average [5]	9 ppm (10 mg/m³)	None
1-hour Average [5]	35 ppm (40 mg/m³)	None
Ozone (O_3)		
8-hour Average [6]	0.08 ppm	Same as Primary
1-hour Average [7]	0.12 ppm	Same as Primary
Nitrogen Dioxide (NO_x)		
Annual Average	0.053 ppm (100 μg/m³)	Same as Primary

ppm = parts per million by volume of air
mg/m³ = milligrams per cubic meter of air
μg/m³ = micrograms per cubic meter of air

(1) Due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution, the agency revoked the annual PM_{10} standard in 2006 (effective December 17, 2006).
(2) Not to be exceeded more than once per year on average over 3 years.
(3) To attain this standard, the 3-year average of the weighted annual mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15.0 μg/m³.
(4) To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 μg/m³ (effective December 17, 2006)
(5) Not to be exceeded more than once per year.
(6) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.
(7) (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is ≤ 1.
(b) As of June 15, 2005 EPA revoked the 1-hour ozone standard in all areas except the fourteen 8-hour ozone non-attainment Early Action Compact areas.

Source: U.S. EPA Office of Air Quality Planning and Standards, www.epa.gov/air/criteria.html

Conformity

Figure 3-16 depicts the current air quality non-attainment and maintenance areas designated by EPA within the Hidden Valley planning area for 8-hour ozone, PM_{10}, and CO. The sources of these pollutants and their deadlines to demonstrate attainment are displayed in Table 3.5. Air pollutant emission sites also shown in Figure 3-16 represent sites of an industrial operation that has obtained a permit for its criteria pollutant emissions. The sites illustrated are the permitted industrial sites listed in 2005 whose emissions triggered certain high-end thresholds for each criteria pollutant. Such industrial operations could be power plants, emergency power substations, compressor stations, industrial processes that involve petroleum products, gas stations, or rock production facilities. The planning area is in conformity for lead (Pb), Sox, NO_x, and $PM_{2.5}$.

ADEQ is the lead state air quality planning agency in Arizona. In addition, both counties within the study area, Pinal and Maricopa, have their own air pollution control programs. Therefore, the counties are responsible for Arizona SIP requirements for any non-attainment areas. There are currently two non-attainment areas and one maintenance area within the Hidden Valley Project area: the Phoenix Non-attainment Area (8-Hour Ozone and PM_{10}) and the Phoenix Maintenance Area (CO). Non-attainment areas may change depending on the severity and extent of various pollutants.

Table 3.5 Non-Attainment and Maintenance Areas in the Hidden Valley Study Area

Air Pollutant	Pollutant Sources	SIP Deadline
8-hour Ozone (O_3)	Formed through complex chemical reactions between emissions of volatile organic compounds and oxides of nitrogen (NOx) in the presence of sunlight. These reactions are stimulated by sunlight and temperature so that peak ozone levels occur typically during the warmer times of the year.	Phoenix Non-attainment Area deadline for attainment of 8-Hour Ozone NAAQS of June 15, 2009.
Particulate Matter (PM_{10})	Includes dirt, soot, smoke and liquid droplets directly emitted into the air by sources such as factories, power plants, cars, construction activity, fires and natural windblown dust.	Phoenix Planning Area was failed meet attainment requirements by the deadline of December 31, 2006 . Plan provisions that provide for attainment of 240-hour PM_{10} NAAQS must be submitted to the EPA by Dec 31, 2007.
Carbon Monoxide (CO)	Produced by incomplete burning of carbon in fuels. Largest source nationwide is transportation. Other sources include wood-burning stoves, incinerators and industrial sources.	Phoenix Non-attainment Area Maintenance Plan was approved in March 2005, changing the designation to attainment. The Maintenance Plan test requirements contain 2006 and 2015 emissions budgets.

Source: Environmental Protection Agency Green Book, 2007

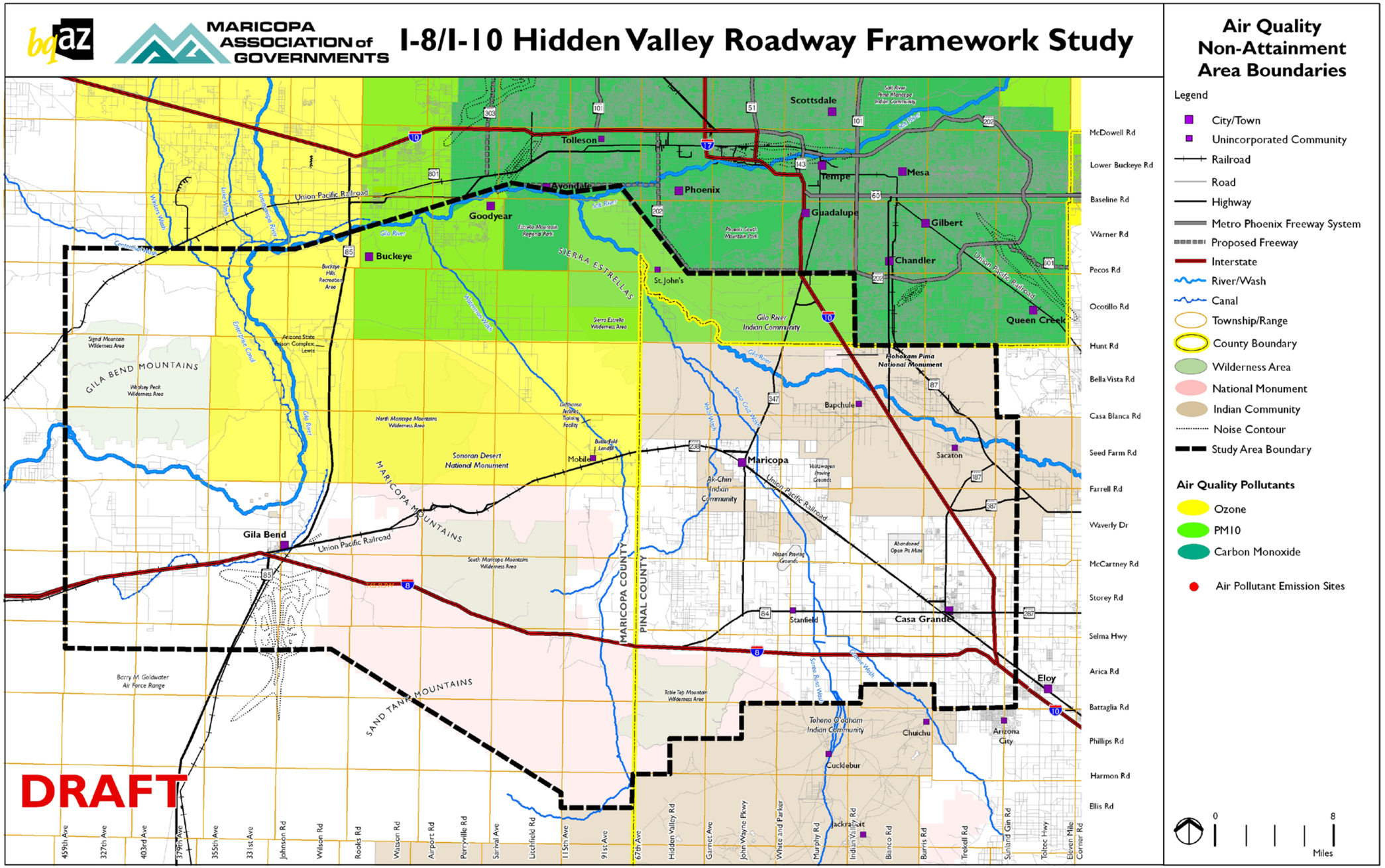
Should EPA designate any non-attainment or maintenance areas in the future, any roadway development project would be required to be in compliance with the SIP established for that area. Air quality modeling would determine whether the proposed project complies with regional air quality requirements. Should the proposed project involve a change in the level of service or an increase in projected traffic levels in specific areas, microscale or "hot-spot" analyses would be required at proposed interchanges and intersections.

ADEQ has installed and operates air quality monitoring stations throughout the state to continually assess the levels of major air pollutants in both metropolitan and non-metropolitan areas. The Hidden Valley study area has monitoring sites in Estrella, Maricopa, Stanfield and Casa Grande.

The air quality dispersion model recommended by EPA and Arizona Department of Transportation (ADOT) for roadway projects that will be used in the analysis for this project is CAL3QHC Version 2.0. The model considers free-flow and idling emissions in conjunction with intersection geometry, wind direction, and other meteorological factors.

Vehicles are the dominant source of CO pollution; therefore, CO is the primary pollutant of concern when considering the effects of a transportation project. Other pollutants generated by vehicles include ozone precursors, hydrocarbons (HC), and nitrogen dioxide. Fine particulate matter (PM_{10}) is also emitted in vehicle exhaust and generated by the interaction of tires with pavement (as well as unpaved roadways). Individual vehicles generate as much as 45 percent of total PM_{10} emissions (MAG 2004). While the EPA has indicated that PM_{10} is a pollutant of concern when considering mobile sources of air pollution (vehicles), guidance for localized PM_{10} analysis has not been adopted by the EPA. Detailed analysis of CO emissions would be required for most major transportation projects.

Figure 3-16 Air Quality Non-Attainment Area Boundaries



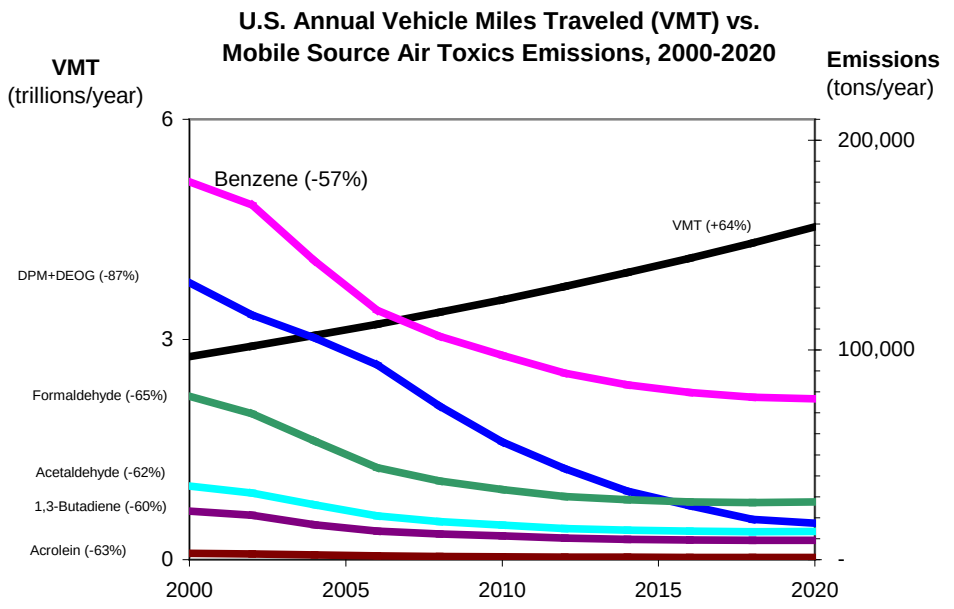
Carbon monoxide impacts are localized; even under the worst meteorological conditions and the most congested traffic conditions, high concentrations occur only within a relatively short distance (300 to 600 feet) of heavily traveled roadways. The HC and NO_2 emissions from vehicles are a concern primarily because of their role as precursors in the formation of O_3 and particulate matter. Ozone is formed through a series of reactions that take place in the atmosphere in the presence of sunlight. Since the reactions are slow and occur as the pollutants are diffusing downwind, elevated ozone levels are often found many miles from the sources of precursor pollutants. The effects of HC and NO_2 emissions are therefore examined on a regional or "mesoscale" basis.

Mobile Source Air Toxics

In addition to the criteria air pollutants for which there are NAAQS, EPA regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners) and stationary sources (e.g., factories or refineries).

Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics defined by the CAA. The MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics result from engine wear or from impurities in oil or gasoline.

EPA is the lead federal agency for administering the CAA Amendments (CAAA) and has certain responsibilities regarding the health effects of MSATs. The EPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources, 66 FR 17229 (March 29, 2001). This rule was issued under the authority in Section 202 of the CAA. In its rule, EPA examined the impacts of existing and newly promulgated mobile source control programs, including its reformulated gasoline program, its national low emission vehicle standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. Between 2000 and 2020, the Federal Highway Administration (FHWA) forecasts that even with a 64 percent increase in vehicle miles traveled (VMT), these programs will reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by 57 percent to 65 percent and on-highway diesel PM emissions by 87 percent, as shown in the graph below.



Notes: For on-road mobile sources. Emissions factors were generated using MOBILE6.2. MTBE proportion of market for oxygenates is held constant, at 50%. Gasoline RVP and oxygenate content are held constant. VMT: *Highway Statistics 2000*, Table VM-2 for 2000, analysis assumes annual growth rate of 2.5%. "DPM + DEOG" is based on MOBILE6.2-generated factors for elemental carbon, organic carbon and SO4 from diesel-powered vehicles, with the particle size cutoff set at 10.0 microns.
Source: ADOT Environmental Planning Group, 2007.

As a result, EPA concluded that no further motor vehicle emissions standards or fuel standards were necessary to further control MSATs. The agency is preparing another rule under authority of CAA Section 202(l) that will address these issues and could make adjustments to the full 21 and the primary six MSATs. A basic analysis of the likely MSAT emission impacts would be needed for any major transportation project.

3.2.9 Hazardous Materials

Information regarding potential hazardous material concerns within the study area was collected using the internet-based tools of the EPA and ADEQ. Figure 3-17 shows various categories of potentially contaminated sites, as currently listed by these agencies. No Initial Site Assessment (ISA) or Phase I Environmental Site Assessment was conducted for any of the sites within the study area and no properties were identified for potential hazardous materials. It is recommended that an ISA, done to American Society for Testing and Materials standards, be conducted for the site of any proposed development within the Hidden Valley Transportation Framework Study area.

Hazardous waste generators are sites that create hazardous waste, such as dry cleaners and gas stations. Generators are divided into categories based on the amount of hazardous waste they produce every month. Sites classified as large quantity generators create larger amounts of hazardous waste than the remaining two categories, small quantity generators and conditionally exempt small quantity generators. Generators present a concern in the event that hazardous materials created on-site are released into the surrounding environment. Hazardous waste generators are located in the GRIC where I-10 enters the reservation along the northern boundary of the study area. Two hazardous waste generators are located in Casa Grande and one is near the I-10/I-8 junction in Pinal County. A search and review of current government records should be conducted to identify the history and current status of such generators.

Toxic release sites represent the location of a known release of toxic materials into the surrounding environment. Several such sites are located along SR-238 near Casa Grande. Bapchule and Maricopa have one toxic release site each. These sites are of special concern when they are in close proximity to a water discharge site or landfill. Water discharge sites represent the location of a storm water or wastewater release into local surface waters (e.g., rivers and streams). The close proximity of water discharge sites, toxic release sites and an open pit mine in Casa Grande represent an increased potential for soil, ground and surface water contamination. Water Discharge Sites are also located in Gila Bend and in Buckeye along the Gila River and the Waterman Wash. Material recovery facilities include recycling centers and transfer stations that would handle hazardous materials. One such facility is located just south of the Casa Grande Municipal Landfill in Eloy along I-8. Underground storage tanks could potentially store hazardous materials, and a leaking underground storage tank (LUST) represents the potential for these hazardous materials to be released into the surrounding environment. Known LUSTs are dispersed throughout the study area, with concentrations in Casa Grande and Gila Bend. In Buckeye, the proximity of LUSTs to Gila River, Waterman Wash and the Enterprise Canal could increase the potential for soil, ground and surface water contamination.

The biggest concern for development in the study area would be the location of known toxic releases. The hazardous waste generators, receivers, landfills, material recovery facilities and LUSTs would be a concern for their potential as a source of hazardous materials contamination, a risk that increases in close proximity to a water discharge site. A review of current government records should be conducted for any potential development areas to identify these sites and assess the current status and extent of any contamination. More in-depth research into the known toxic release sites would be needed to determine the source, quantity and current status of any releases from them, as well as any on-site remediation that has been conducted.

3.2.10 Public Utilities

Figure 3-18 shows the locations of pipelines and major electric transmission lines for Arizona Public Service (APS) and the Salt River Project (SRP) within the study area. Existing power lines traverse the entire study area, with those shown ranging from 230kV to 500 kV. These high voltages generally require minimum clearances, starting at 25 feet for the lower range of voltages, to maintain public safety. Four power line receiving stations are located in the study area, one in Maricopa County and three in Pinal County. There are two switching yards in the study area: one just north of Gila Bend and the other just northeast of the Arizona State Prison Complex at Lewis in Buckeye. Both sites are along the proposed SR-85 divided highway alignment.

Figure 3-17 Hazardous Materials

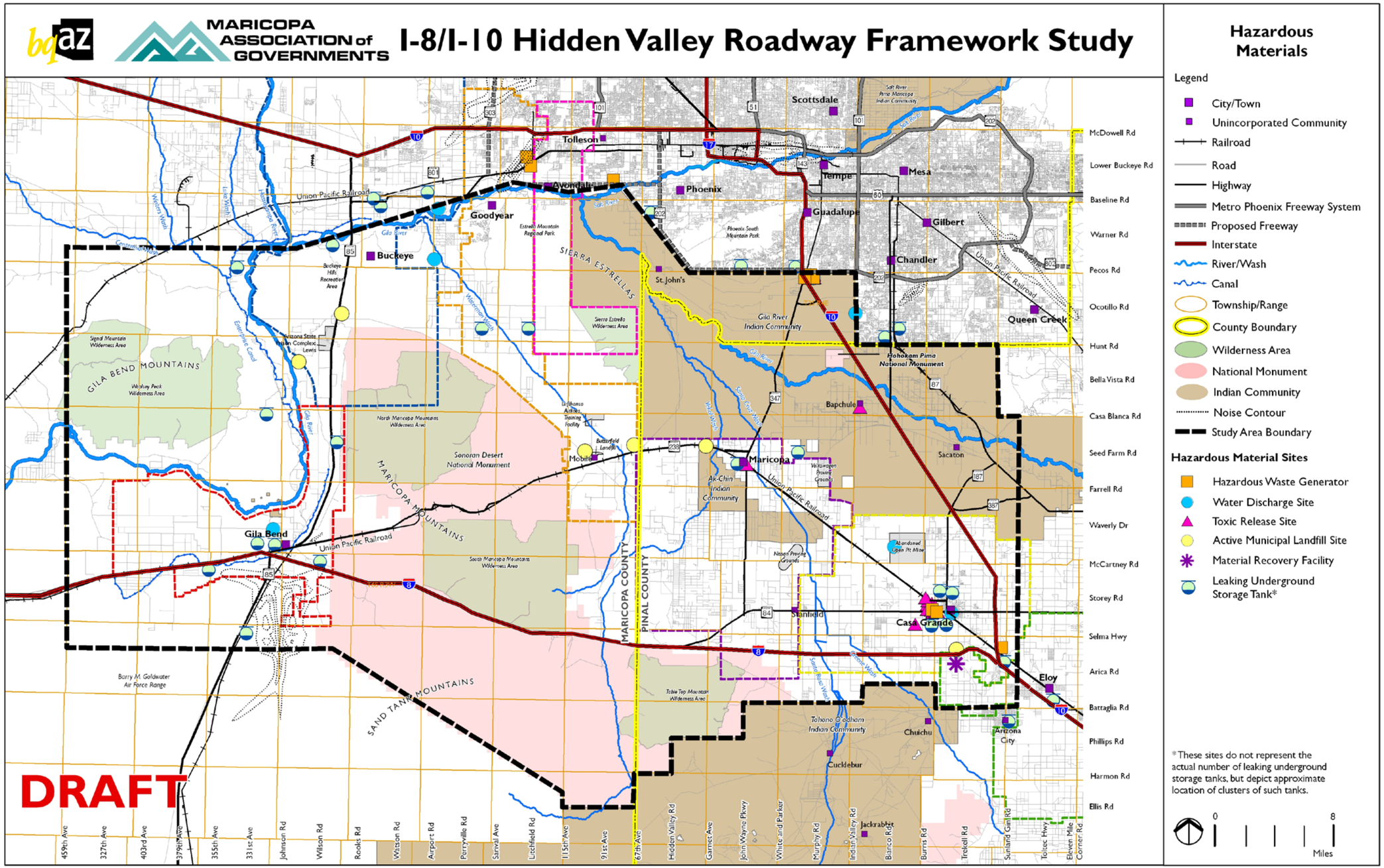
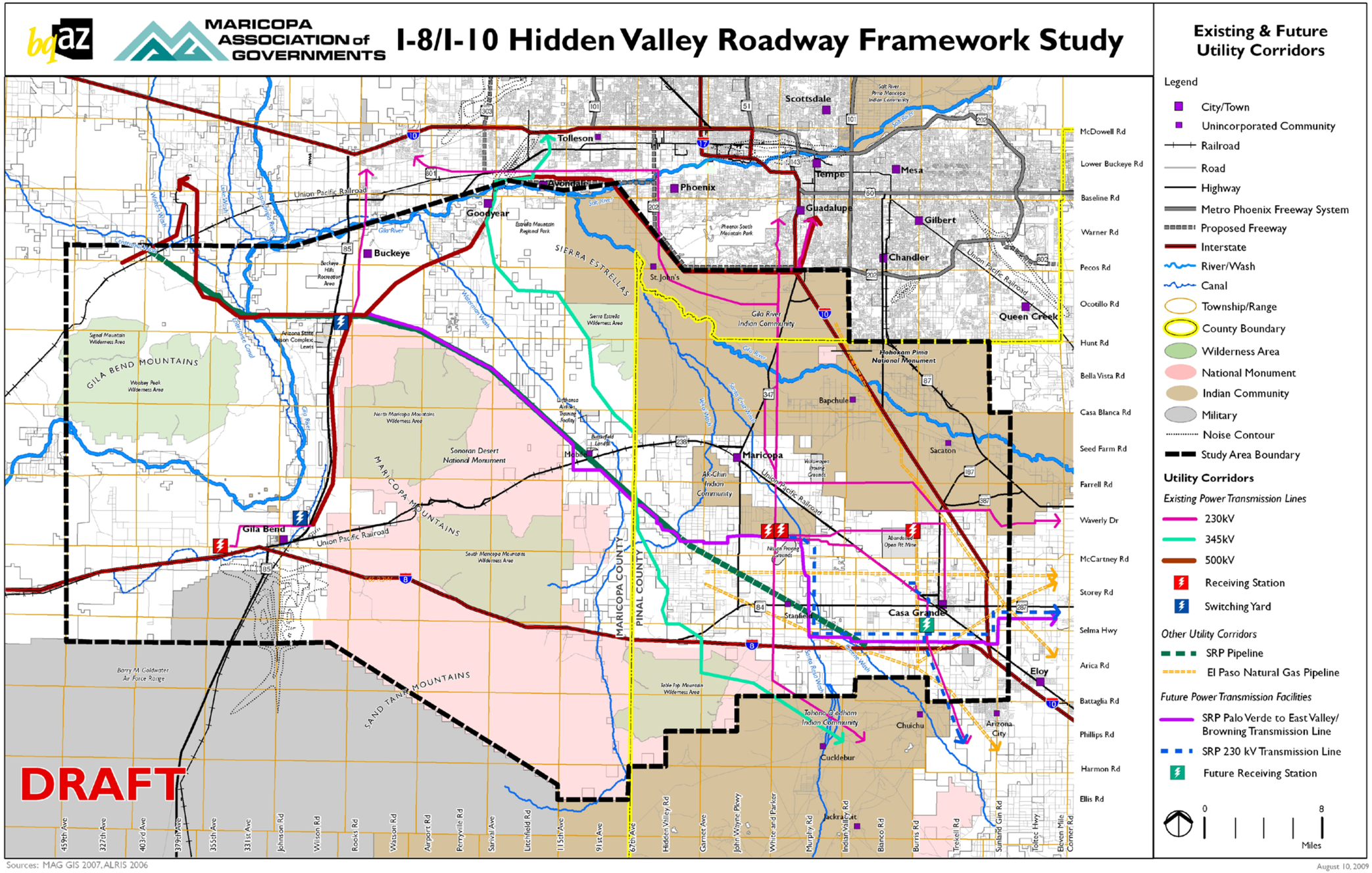


Figure 3-18 Existing and Future Utility Corridors



One new SRP transmission line has been approved for this area. The Palo Verde to Southeast Valley/Browning transmission line corridor originates at the Red Hawk receiving station near the Palo Verde Nuclear Generating Station (PVNGS) in Buckeye, crossing into Pinal County south of the Ak-Chin Indian Community, paralleling I-8 through Eloy, turning north through Coolidge, and ending at the Browning substation in Apache Junction. This transmission line received a Certificate of Environmental Compatibility from the Arizona Corporation Commission in August 2006. The project will be constructed in two phases, with completion of the western segment (Red Hawk substation to Santa Rosa substation) in 2008, and completion of the eastern segment (Santa Rosa substation to Southeast Valley/Browning substation) expected in 2011. An SRP 230kV line received approval for construction from the Desert Basin Generating Station in Casa Grande to a future Extra High Voltage substation south of Coolidge (called Pinal South for planning purposes).

Other major utility lines in the study area include an SRP pipeline and the El Paso Natural Gas line. Their locations need to be considered when siting new development, as they are difficult and expensive to build or relocate. Many existing and planned utility corridors share rights-of-way with major transportation and drainage facilities.

3.2.11 Aviation Facilities

Figure 3-19 presents the major airports and low-level flight training paths in the study area. The map displays the various categories of airports and heliports, which are taken from the data on current Federal Aviation Administration Form 5010-1, Airport Master Record. ADOT prepares and regularly updates the State Aviation Systems Plan in which it categorizes airports as primary or secondary. Fourteen airports in the study area are included in the Systems Plan, of which 12 are primary and two secondary.

Primary airports are those that have ten or more based aircraft and 2,000 or more annual aircraft operations. A based aircraft is one that is permanently stationed at an airport, usually through some form of agreement between the aircraft owner and airport management. Primary airports are further divided into three categories—Commercial Service airports, Reliever airports and General Aviation airports. Commercial Service airports are publicly owned airports that emplane 2,500 or more passengers annually and receive scheduled passenger air service. No commercial service airports are located in the study area. Reliever airports serve to relieve general aviation traffic at a Commercial Service airport, providing more general aviation access to the community and the region. There are no reliever airports in the study area. The remaining primary airports are referred to as General Aviation airports. This category includes publicly owned, privately owned, public-use and private-use airports/heliports that are further divided into community, rural and basic airport categories. There are four general aviation, public use airports within the study area: Gila Bend Municipal Airport, Estrella Sailport, Memorial Airfield and Casa Grande Municipal Airport.

Airports that do not qualify for inclusion in the primary airport system are called secondary airports and are mainly public use airports/heliports. These are categorized as community or rural airports. One secondary community airport, Memorial Airfield, lies just outside the study area near the SR-101/SR-202 junction in Chandler. Ak-Chin Community Airfield is a rural secondary airport that lies within the Ak-Chin Indian Community.

Table 3.6 lists the fifteen other airports and one heliport in the study area. These are primarily privately-owned airports with unpaved runways and are not included in the State Aviation System Plan. The city of Maricopa is investigating the feasibility of developing a new general aviation airport within the city limits.

Figure 3-19 Aviation Facilities

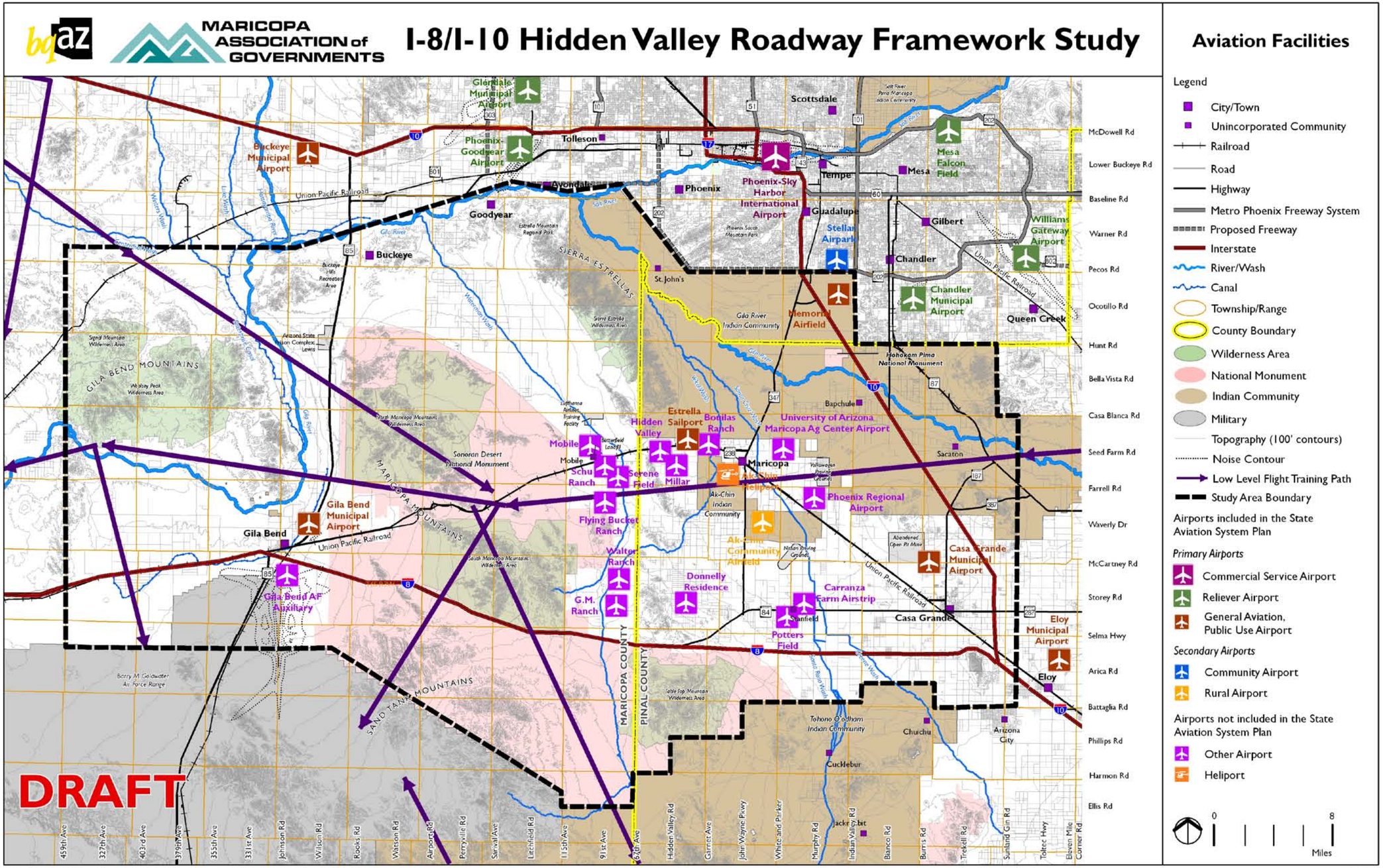


Table 3.6 Other Airports in the Hidden Valley Study Area (not on the Primary or Secondary State System)

Airport	Runway Surface	Ownership
Boulais Ranch	Dirt	Private
Carranza Farm Airstrip	Dirt	Private
Donnelly Residence	Dirt	Private
Flying Bucket Ranch	Turf	Private
Hidden Valley	Dirt	Private
Gila Bend Air Force Auxiliary	Asphalt	Private
G.M. Ranch	Dirt	Private
Millar	Dirt	Private
Mobile	Asphalt	Private
Phoenix Regional Airport	Asphalt	Private
Potters Field	Dirt	Private
Schu Ranch	Dirt	Private
Serene Field	Dirt	Private
U of A Maricopa AG Center	Dirt	Public
Walter Ranch	Dirt	Public
Ak-Chin Heliport	Concrete	Private

Source: AECOM analysis of Federal Aviation Administration Form 5010-1, Airport Master Record.

The low-level flight training paths shown in Figure 3-19 are military training routes. These are designated as low-level military routes that allow Department of Defense aircraft to conduct flights that may descend to altitudes as low as 100 feet at speeds above 250 knots (nautical miles per hour). All the routes shown in Figure 3-19 have minimum altitudes of 300 feet above ground level.

3.2.12 Title VI/Environmental Justice Considerations

Title VI of the Civil Rights Act of 1964 and related statutes assure that individuals are not excluded from participation in, denied the benefit of, or subjected to discrimination on the basis of race, color, national origin, age, sex, or disability. Executive Order 12898 on Environmental Justice directs that federal programs, policies, and activities not have a disproportionately high and adverse human health and environmental effect on minority and low-income populations in the United States. Consideration of low-income populations during development of federally-funded projects is the primary addition of Executive Order 12898 to the original requirements of Title VI. This section highlights existing conditions within the study area with respect to Title VI and Environmental Justice issues.

USDOT issued its Order 5610.2 on April 15, 1997, to respond to and implement Executive Order 12898. The federal guidance for evaluating environmental justice issues is found in Guidance for Federal Agencies on Key Terms in Executive Order 12898, which was developed by the Interagency Working Group on Environmental Justice, August 1995.

USDOT's Order on Environmental Justice provides definitions of the minority groups addressed by the Executive Order. Minority groups include the following:

- Black – a person having origins in any of the black racial groups of Africa.
- Asian – a person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent.
- American Indian and Alaskan Native – a person having origins in any of the original people of North America and who maintains cultural identifications through tribal affiliation or community recognition.
- Native Hawaiian or Other Pacific Islander – a person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.

Those who considered themselves as an "Other" race and a combination of two or more races involving any of the above groups are also classified as minority for this study. The Final (1997) USDOT Order on Environmental Justice defines a low-income person as one whose household income is at or below the U.S. Department of Health and Human Services poverty guidelines. In the case of a community or group, the median household income is measured. The 2007 federal poverty guideline is $20,650 for a family of four.

Data from the 2000 U.S. Census was collected and reviewed to perform the Title VI/Environmental Justice analysis. Table 3.7, Population Characteristics, summarizes the demographic information for each of the census places and census tracts in the study area. Census tracts are small statistical subdivisions of a county.

Five census places and eleven census tracts contain potentially affected populations in the study area. Specific information on the identification of minority and low-income populations is provided below. A census place/census tract was categorized as having a large concentration of an environmental justice population (minority, senior, female-headed household, low-income or disabled) if the population of the group in question equaled or exceeded 50 percent of the total population of that census tract, or was at least 10 percentage points more than the respective county percentage of the group in question.

Table 3.7 Population Characteristics (Year 2000)

Location	Total Population	Non-White Population (Percent)	Age over 60 years (Percent)	Gender* (Percent)	Low-Income Households** (Percent)	Residents with a disability*** (Percent)
Maricopa County	3,072,149	23	15	6	18	8
Pinal County	179,727	30	22	7	26	9
Avondale city	35,883	37	8	7	16	7
Buckeye town	6,537	27	11	11	30	6
Casa Grande city	25,224	35	17	11	25	8
Gila Bend town	1,980	49	12	9	38	9
Goodyear city	18,911	22	14	4	8	4
Ak-Chin Village CDP****	669	96	7	17	42	10
Maricopa CDP	1,040	54	9	7	28	12
Sacaton CDP	1,584	98	7	14	55	7
Stanfield CDP	651	49	11	10	39	13
Maricopa County						
Census Tract 506.01, Buckeye	6,993	22	9	7	18	4
Census Tract 506.02, Unincorporated	4,838	19	12	6	19	9
Census Tract 506.03, Unincorporated	2,196	25	13	3	32	9
Census Tract 822.01, Avondale	4,190	38	10	6	20	10
Census Tract 7233.01, Goodyear	2,911	12	9	2	2	4
Census Tract 7233.02, Gila Bend	5,417	41	11	7	27	11

Table 3.7 Continued

Location	Total Population	Non-White Population (Percent)	Age over 60 years (Percent)	Gender* (Percent)	Low-Income Households** (Percent)	Residents with a disability*** (Percent)
Maricopa County						
Census Tract 9410, Gila River Indian Community	2,662	98	7	29	61	10
Census Tract 9411, Gila River Indian Community	37	95	0	0	100	0
Pinal County						
Census Tract 12, Unincorporated	3,658	35	13	7	26	13
Census Tract 13.01, Casa Grande	3,179	21	30	6	26	10
Census Tract 13.02, Casa Grande	8,883	27	16	11	23	9
Census Tract 14.01, Casa Grande	6,467	27	16	6	19	8
Census Tract 14.02, Casa Grande	8,027	44	19	13	32	9
Census Tract 15, Casa Grande	3,846	51	12	13	38	14
Census Tract 16, Casa Grande	4,153	30	18	9	26	8
Census Tract 17, Maricopa	8,546	42	12	6	29	9
Census Tract 19, Eloy	2,332	52	13	10	42	5
Census Tract 20, Eloy	8,990	45	8	16	36	7
Census Tract 9410, Gila River Indian Community	56	100	0	0	0	0
Census Tract 9411, Gila River Indian Community	2,820	98	6	25	56	8
Census Tract 9412, Gila River Indian Community	5,715	95	6	29	49	8

NOTE: Shaded boxes represent affected environmental justice populations, either meeting the U.S. Department of Health and Human Services poverty guidelines (Median Household Income <$20,650, for a family of four,) or having a large concentration (equaling or exceeding 50 percent) of a special group, or exceeding by 10 points the county percentage for that category)

** This category has been computed by using the percentage of female-headed households with children of the total number of households from Census 2000 Summary File 3 (SF 3), Table P.57*

*** The 2007 Poverty Guidelines from the US Department of Health and Human Services specify $20,650 as the poverty guideline for a household of four persons. Data from Census 2000 Summary File 3 (SF 3), Table P.52 has been taken to calculate the percentage of low-income households*

**** Refers to residents with a self-care disability or a "go outside the home" (formerly mobility) disability. Some double counting may occur; i.e., persons with both a self-care and a go-outside-the-home disability may be counted twice.*

***** CDP refers to a Census Designated Place which are communities that lack separate municipal government but otherwise resemble incorporated places such as cities or villages.*

Source: U.S. Census 2000

Three census tracts (Tracts 9410, 9411 and 9412) spanning both counties make up the GRIC and have potentially affected populations, mainly minority, low-income and female-headed households with children. Similarly, the Ak-Chin Village Census Designated Place (CDP) has affected population as well. In the western part of the study area, one census tract (Tract 506.03) has low-income population. However, two-thirds of this tract lies outside the study area and the part within the study area encompasses the Signal Mountain and Woolsey Peak Wilderness Areas. Thus, it can safely be said that most of the population of this tract exists outside the study area. In addition, two census tracts near Casa Grande have a significant minority population. Figure 3-20 highlights these population characteristics within the study area.

3.2.13 Environmental References

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3.3 Existing Land Use

Figure 3-21 illustrates existing land uses within the study area. The following subsections summarize key land uses and activity centers in the study area portions of Buckeye, Goodyear, Avondale, Gila Bend, Maricopa, Eloy and Casa Grande.

Avondale

Two-thirds of the planning area of Avondale sits south of the Gila River. It is mostly undeveloped with vacant land and open space as the main land uses, including portions of Estrella Mountain Regional Park and Sierra Estrella Wilderness Area. The regional park isolates this primarily rural area from the rest of the city.

Buckeye

The entire MPA of Buckeye south of Gila River lies within the study area. Most of the land is vacant or a combination of open space and agricultural land along the Gila River. The open space category includes all passive and active open space, cemeteries, golf courses, wilderness areas and the Sonoran Desert National Monument. The Arizona State Prison Complex at Lewis, along with some commercial and public uses, are located at the intersection of Patterson Road and SR-85.

Figure 3-20 Title VI/Environmental Justice Populations

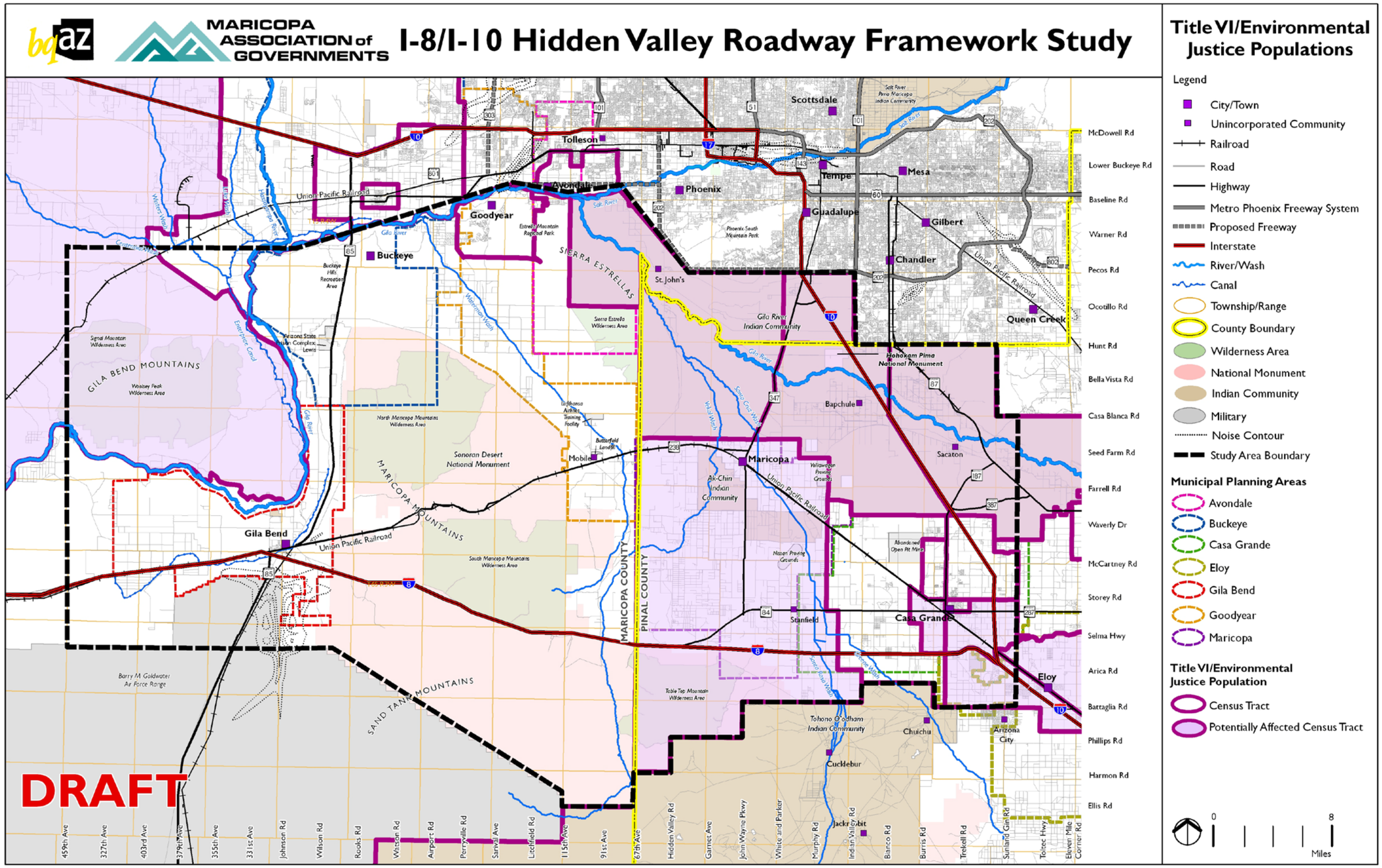
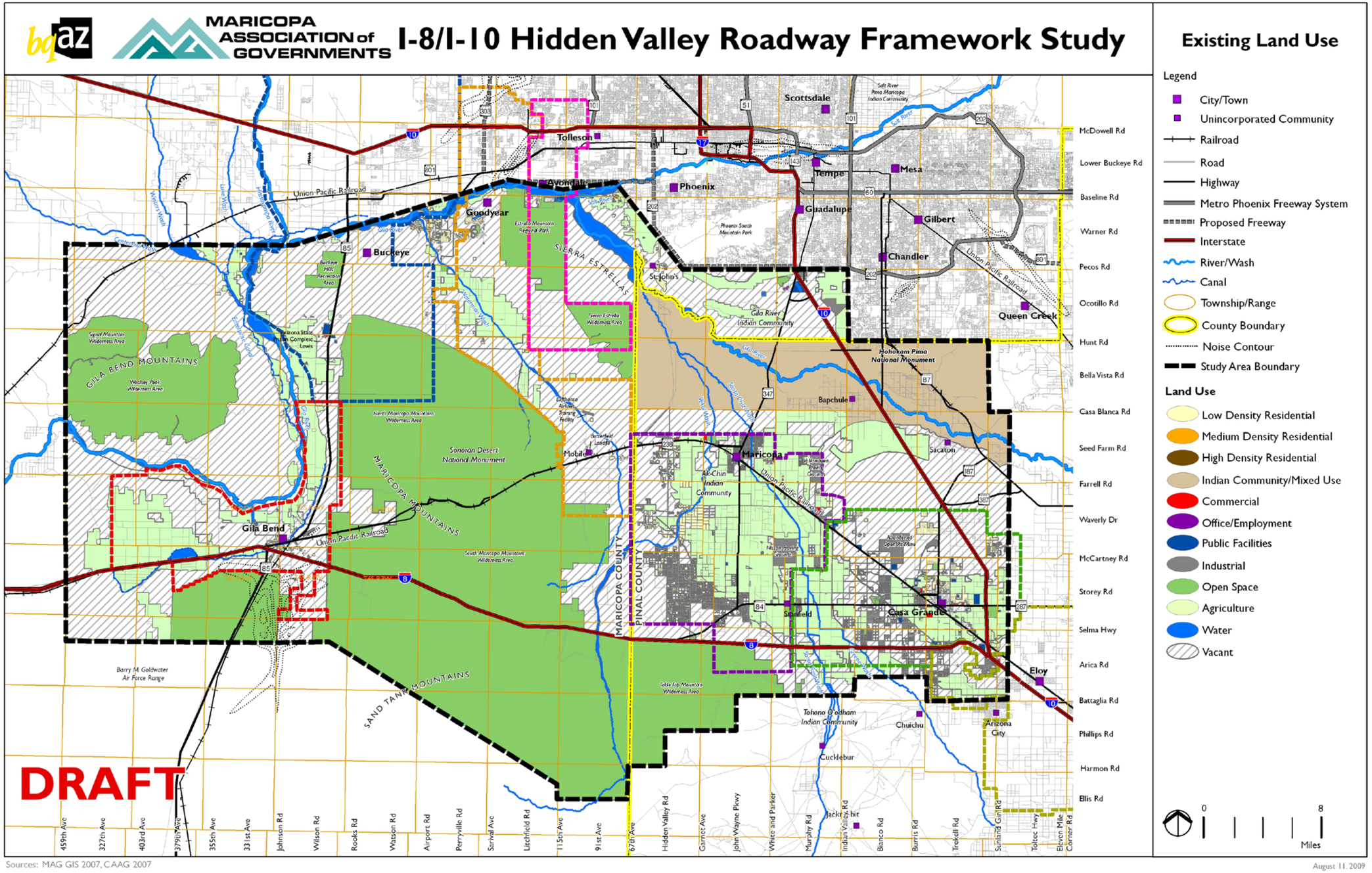


Figure 3-21 Existing Land Use



Casa Grande

Almost all of the Casa Grande MPA lies within the study area. It consists primarily of low-density residential development and agricultural land. Most of the development is concentrated along Pinal Avenue, SR-287 and Jimmie Kerr Boulevard. Industrial uses focus on the UPRR, which cuts diagonally across the MPA. Land adjacent to I-10 has been developed primarily for farmland or low-density residential use. A disused open pit copper mine exists in the north central part of the MPA, just north of the UPRR. Most of the incorporated area of Casa Grande lies north of the UPRR and west of I-10.

Eloy

The northwest portion of the Eloy MPA lies within the study area and is characterized by agricultural use. The land next to I-10 is primarily vacant, with several master-planned communities in the planning stages.

Gila Bend

The entire Gila Bend MPA lies within the study area. Approximately half of the area is currently used for agricultural purposes while most of the remainder is vacant and undeveloped. Only one percent of the MPA is developed, consisting of low-density residential use, and is concentrated along SR-85, close to the junction of SR-85 and I-8.

Goodyear

The entire Goodyear MPA south of proposed SR-801 lies within the Hidden Valley study area. Goodyear has traditionally been an agricultural community and much agricultural land still exists along Waterman Wash in the study area. Three major master planned communities are located within the MPA, namely Estrella, King Ranch and Amaranth in Mobile. Estrella (formerly Estrella Mountain Ranch) is partially constructed and inhabited, while the other two developments are still in the planning stages. A Lufthansa Airlines training facility is located on 99th Avenue just north of Mobile and the Butterfield Landfill sits at the intersection of 91st Avenue and Maricopa Road in Mobile.

Maricopa

The entire MPA of Maricopa lies within the study area. Land use patterns within the city reflect a predominantly agricultural character with increasing conversion to residential use. Many master planned communities are in various planning stages. Many service-based and commercial uses are concentrated along SR-347 in the Old Town area and at the Smith-Enke/SR-238 intersection, although the largest commercial center is on the Maricopa-Casa Grande Highway at Porter Road. The Volkswagen Proving Grounds form most of the industrial land use located at the northeastern edge of the MPA boundary. The Ak-Chin Indian Community also falls within the MPA. Substantial acreages near the western boundary of the planning area are vacant, federally managed lands.

Unincorporated Maricopa County and Pinal County

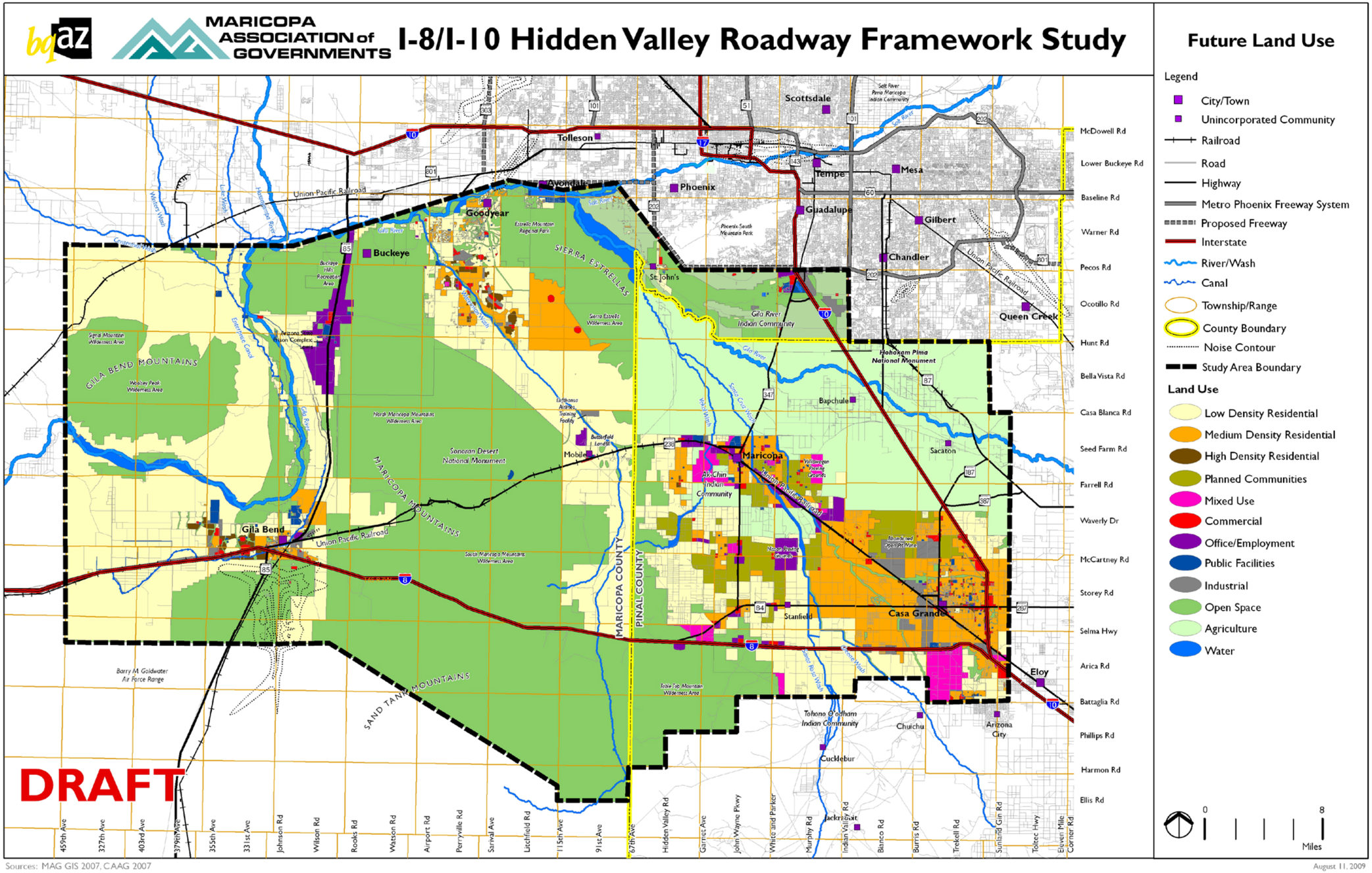
Areas of unincorporated Maricopa and Pinal counties that do not lie in any of the MPAs are mainly vacant and undeveloped, except for portions of the GRIC. Large tracts of protected open space are located throughout the study area, including the wilderness areas, regional parks, Sonoran Desert National Monument and Barry M. Goldwater Air Force Range.

Within the Gila River Indian Community and the Ak-Chin Indian Community, the agriculture is the dominant use. Harrah's Phoenix Ak-Chin Casino lies within the study area in the Ak-Chin Indian Community.

3.4 Future Land Use

Figure 3-22 depicts planned future land uses, based on the adopted general plan of each jurisdiction. Each municipality's general plan not only covers the incorporated area, but its entire MPA, typically including unincorporated land envisioned for future annexation. As Figure 3-22 shows, most of the vacant land in the unincorporated portions of the various MPAs and counties is planned for low-density residential development. The "vacant" category from the existing land use map is absent here, since this figure is intended to represent Buildout conditions. The GRIC is shown as agricultural land use, and there are pockets of commercial, mixed-use and office/employment uses along major transportation corridors where the current land use is either vacant or agricultural.

Figure 3-22 Future Land Use



In 1998, the Arizona legislature passed the Growing Smarter Act, which clarified and strengthened required planning elements in the general plans of municipalities and comprehensive plans of counties. For cities and towns with (a) a population over 10,000, or (b) a smaller population and an average annual growth rate exceeding two percent during the past ten years, required elements include land use, circulation, growth areas, environmental planning, cost of development, open space, and water resources. Counties having a population of more than 200,000 people–including Maricopa and Pinal--are also subject to these requirements. Other cities, towns and counties need include only land use and circulation elements.

The legislature passed "Growing Smarter Plus" in 2000 to further enhance land use planning statutes. Additional requirements of this legislation include: a more effective public participation plan; exchange of plans and coordination with regional planning agencies; authorization for cities and counties to designate service area limits beyond which services and infrastructure will not be provided at public expense; and authorization for counties to impose development impact fees similar to those permitted in municipal development fee statutes.

The following subsections summarize key land uses and activity centers in the study area portion of municipalities, counties and Indian tribal communities. Each city, town or county has updated its general or comprehensive plan to reflect the 1998 Growing Smarter Act.

Avondale

Estrella Mountain Regional Park and Sierra Estrella Wilderness Area cover large tracts of land in the Avondale MPA. The general plan outlines rural-density residential, office, and employment along the Gila River. This area is also considered a growth area with potential for resort development. Toward the southern edge of the planning area, medium-density residential is proposed.

Buckeye

The Town of Buckeye's Draft General Plan and Development Code Update calls for the development of self-sustaining, mixed-use activity centers and the creation of diverse, transit- and pedestrian-friendly Village Core Mixed Use Areas, linked through a connected system of open space or transit. Such connections will occur in the town centers of these villages or master-planned communities. Development of attractive gateways and high-capacity roadway corridors are among the main concepts driving this general plan. Very low to low-density residential is proposed all along the south side of the Gila River. Regional commercial, industrial, village core mixed-use and medium-density residential uses are proposed along SR-85 south of its intersection with the Hassayampa North-South Freeway (a future facility proposed in the I-10/Hassayampa Valley Transportation Framework Study). The area south of the river encompasses one of the village-core mixed use areas. Most of the area outside the planned communities and villages will be preserved as open space.

Casa Grande

Casa Grande will continue to be a largely suburban residential community with medium densities throughout its planning area. Industrial uses will be concentrated along the UPRR and I-8. A few large-scale commercial developments are planned along I-10. Approximately 4,600 acres of residential and commercial development is proposed near the I-8/I-10 junction. The city has identified future growth areas south of I-8, east of I-10 and north of McCartney Road for primarily low-density residential use.

Eloy

A portion of Eloy falls within the study area. It consists of a large tract of land from the western MPA boundary to Peart Road, south of I-8, and is planned for mixed-use development. Low- to medium-density residential will remain as the dominant use elsewhere.

Gila Bend

Gila Bend is projected to have medium- to high-density residential development along the two high-capacity transportation corridors, SR-85 and I-8. Industrial and commercial use, along with some public facilities, will take advantage of the access provided by these major transportation corridors. Two master planning communities, Sonoran Trails and Paloma Ranch, are in the planning stages within the MPA.

Goodyear

The city of Goodyear will continue developing with a mix of low-density and medium-density residential and commercial land uses within master-planned areas. In the portion of the MPA within the study limits, medium-density residential and village-center type mixed-use development is proposed along Waterman Wash, east of Tuthill Road. The Goodyear General Plan also identifies one growth area within the study area, called the Gila River Corridor, which spans an area approximately one-half mile wide on each side of the river. This area is projected to include residential, employment and open space land uses, developed in a manner environmentally compatible with the river. The corridor is projected to contain a buildout population of over 12,400 and an employment base of approximately 2,500 jobs.

Goodyear recently expanded its MPA boundaries by 95 square miles to contain the land between the Sonoran Desert National Monument and Maricopa-Pinal County line, south from the previous Goodyear MPA boundary and the Avondale MPA south boundary past SR-238. This land will incorporate additional master-planned communities into the MPA, including Amaranth, a proposed mixed-use community of over 40,000 dwelling units. In the future, Goodyear proposes to further extend the MPA to I-8. This extension will incorporate the Vekol Valley master-planned community, another large mixed-use development.

Maricopa

Medium-density residential with a number of master-planned communities is proposed along SR-238 and SR-347 south of the Ak-Chin Indian Community. Office and employment use is planned along the Maricopa-Casa Grande Highway (SR-238). Other areas with a concentration of employment will include the Nissan Proving Grounds, the Volkswagen Proving Grounds and the Phoenix Regional Airport area, located adjacent to the planning boundary of Casa Grande. The currently developed portion of the planning area is largely hemmed in by the two Indian communities, which will present transportation challenges as the city expands south and west of the Ak-Chin lands.

Unincorporated Maricopa County and Pinal County

The Maricopa County Comprehensive Plan indicates General Plan Development Areas (GPDA), or growth areas within the MPAs of Buckeye, Avondale, Goodyear and Gila Bend. A GPDA is an unincorporated area that is likely to be annexed by a city or town in the future, and is therefore included in an adopted municipal general plan (and in the MPA for that municipality). Urban growth area plans have been described in the future land use descriptions for cities and towns.

Gila River Indian Community

The Gila River Indian Community is currently undergoing an internal General Plan Land Use update. Pinal County has nearly completed its Comprehensive Plan Update, which will replace the current comprehensive plan. This plan will include a vision statement to guide decision-making and manage anticipated growth and development. The plan is also focusing on strategies to create employment centers in Pinal County so that residents can work near their homes.

Ak-Chin Indian Community

The Ak-Chin Indian Community has a general plan that provides guidelines for land use and transportation decisions. The community plans future commercial development as well as new public and tribal facilities, such as a judicial complex, tribal administration and expansion of the casino hotel.

3.5 Land Ownership

The BLM owns the largest amount of land in the Hidden Valley study area, followed by private landowners, the Indian communities and Arizona State Land Department. Military land consists mostly of the Barry M. Goldwater Air Force Range. Table 3.8 summarizes the distribution of land ownership within the study area, and Figure 3-23 illustrates the land ownership patterns.

Figure 3-23 Land Ownership

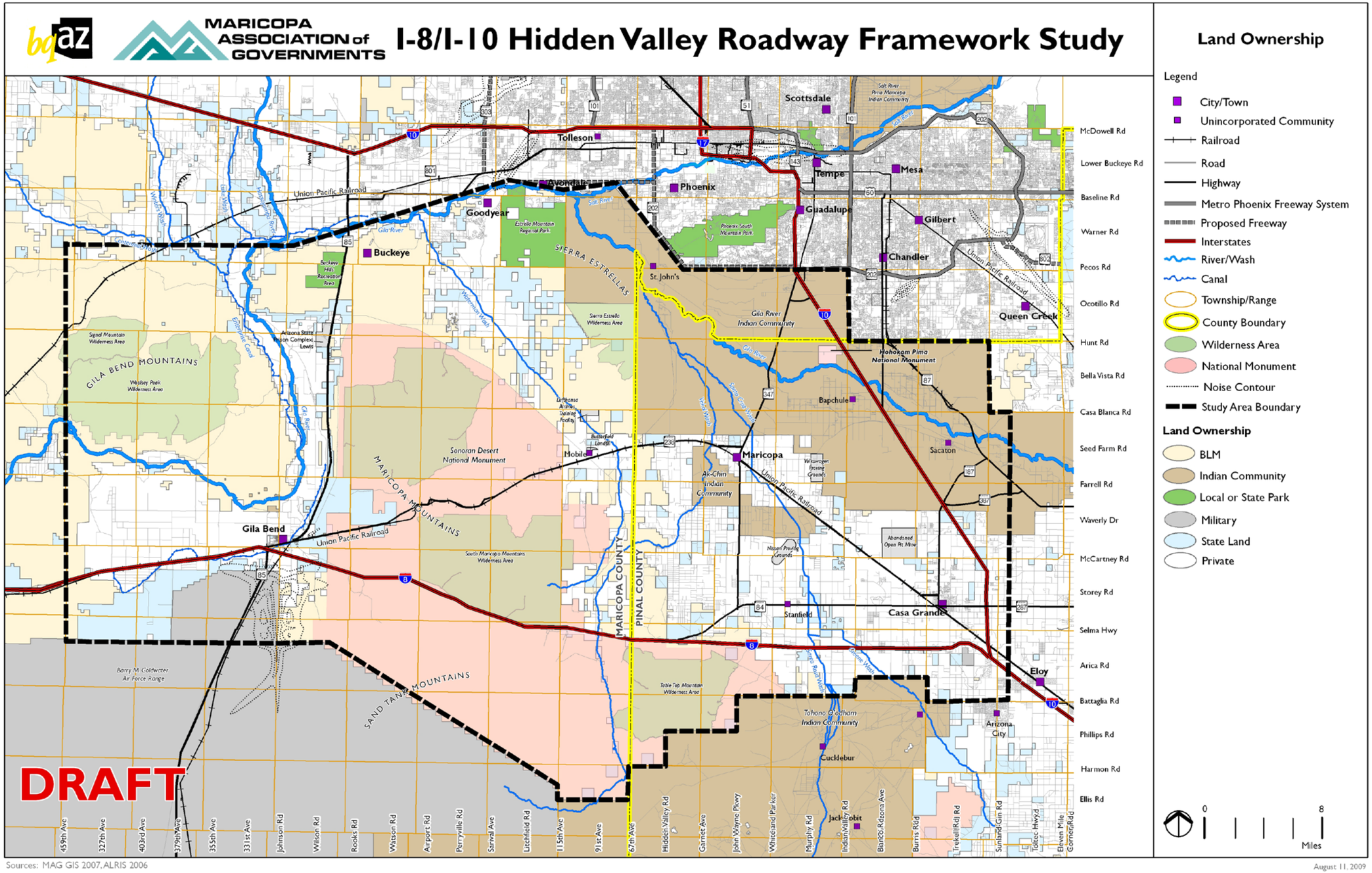


Table 3.8 Land Distribution in the Hidden Valley Study Area

Ownership	Area (in Acres)	Area (in sq. miles)	Percentage*
Bureau of Land Management	875,449	1,368	46
Private	503,217	786	26
Indian Lands	352,352	551	18
State Trust Lands	124,850	195	6
Military	33,950	53	2
Local and State Parks	22,999	36	1
State Wildlife Area	8,104	13	0
National Park Service	1,575	2	0
Bureau of Reclamation	52	0	0
Total	**1,922,548**	**3,004**	**100**

*Due to rounding, percents do not add precisely to 100.0.
Source: ALRIS 2006

3.6 Public Land Ownership

Most public lands in the study area are managed by ASLD or BLM. ASLD has authority over State Trust lands until they are sold or leased, when planning authority is handed over to the appropriate city or county. BLM retains planning authority and control over its lands and rarely sells them to private entities, but may participate in land swaps in order to accumulate larger masses of environmentally sensitive land for preservation, or to release isolated holdings.

Two BLM public land management studies are currently underway, as shown in Figure 3-24 and summarized below:

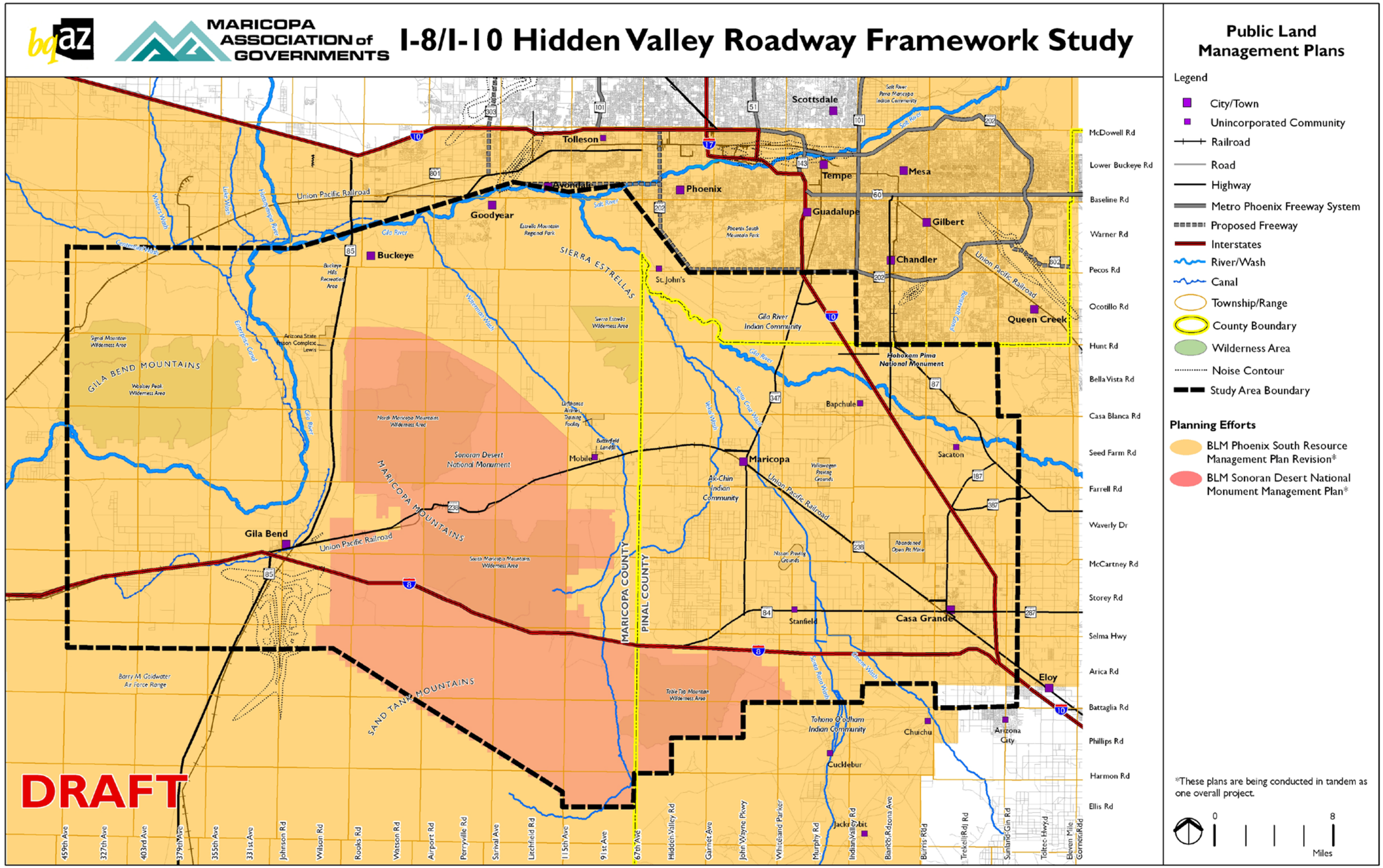
- *Phoenix South Planning Area Resource Management Plan (RMP)*: The Phoenix South Planning Area encompasses approximately 932,000 acres, covering much of Maricopa County and portions of Gila, Pima, Pinal, and Yuma counties. The RMP will establish the amount of human interaction with the natural environment and the appropriate and allowable uses. Generally speaking, the overarching vision of the BLM is to retain an open and functioning desert ecosystem, while still meeting multiple-use needs.
- *Sonoran Desert National Monument RMP and Environmental Impact Statement (EIS)*: This project is being conducted concurrently with the Phoenix South Planning Area RMP. The Sonoran Desert National Monument consists of 486,000 acres in the Phoenix South Planning Area. This study will guide the intensity of human interaction in and around the national monument. One EIS will be prepared for both projects. Drafts of both documents are currently underway (as of August 2007).

3.7 Planned and Proposed Development Projects: Master-Planned Communities

As of May 2007, at least 160 master-planned communities were planned within the study area. These communities are at various stages of development, with a general concentric growth pattern out of the historically urbanized areas of cities and towns.

The Maricopa County portion of the study area has a great deal of BLM land, including the Sonoran Desert National Monument and five wilderness areas, which preclude large-scale development except in a few areas of large private land holdings. Private land within Buckeye's boundaries is concentrated between the (north-south portion of the) Gila River and SR-85, with little developer interest to date. With the exception of Merrill-Paloma Ranch, most private land in Gila Bend is also undeveloped and open to new development proposals. Goodyear recently extended its MPA south beyond SR-238 to include Mobile, with plans for future expansion to I-8. Three large master-planned communities comprise the larger private land holdings in the MPA, with the rest of the MPA somewhat checkerboard-patterned in land ownership. Goodyear is experiencing a north-to-south growth pattern.

Figure 3-24 Public Land Management Plans



Much of the Pinal County portion of the study area outside the Indian communities is private land. More than 90 percent of the planned communities in the entire study area are located in the Casa Grande, Maricopa and Eloy MPAs. Two master-planned communities are entitled for over 7,000 acres, but the majority of planned developments are less than 300 acres in size.

Planned Communities Development Overview

Figure 3-25 shows all of the planned residential developments known within the study area as of May 2007, depicting approximately 160 planned developments, at various planning stages. Figure 3-26 shows a more detailed map of the planned communities within the Pinal County portion of the study area. More detailed information on each of these communities can be found in Table 3.9. Pertinent information was gathered from developers and local jurisdictions. The study team made every effort to obtain accurate and complete information up to July 2007.

Table 3.9 Hidden Valley Master-Planned Communities

Name	Status	Total Acres	Total Dwelling Units
MARICOPA COUNTY			
Buckeye MPA			
Ladera	Planned	1,920	6,218
Gila Bend MPA			
Bella Tesoro	Planned	1,280	1,400
Merrill-Paloma Ranch	Active	10,000	50,000
Saguaro Ranch	Active	320	1,000
Sonoran Trails	Active	2,400	8,109
Goodyear MPA			
Amaranth	Planned	9,400	41,261
Estrella	Active	20,050	51,070
King Ranch	Active	2,030	5,413
Rainbow Ranch	N/A	N/A	N/A
Vekol Valley	N/A	N/A	N/A
PINAL COUNTY			
Casa Grande MPA			
Acacia Farms	Entitled	409	1,354
Acacia Landing	Built Out	86	190
Acacia Lofts	Construction	17	286
Acacia Ranch	Entitled	666	2,258
Addison Park	Entitled	104	370
Arizona Desert Estates MH and RV Park	Entitled	327	2,825
Arroyo Grande	Anticipated	105	312
Arroyo Linda	Entitled	154	557

Table 3.9 Continued

Name	Status	Total Acres	Total Dwelling Units
PINAL COUNTY			
Casa Grande MPA			
Arroyo Vista	Anticipated	151	509
Avalon	Active	80	266
Bella Vista Estates	Entitled	82	261
Big Trail	Anticipated	640	2,177
Black Mountain Estates	Entitled	123	102
Bright Sky Farms	Entitled	90	272
Carlton Commons	Construction	373	1,418
Casa Grande Crossings	Anticipated	257	635
Casa Grande Trails	Active	125	389
Casa Grande West	Entitled	160	508
Casa Vista	Construction	109	366
Chaparral Estates	Active	105	116
Copper Buttes	Entitled	78	251
Copper Valley Resort	Entitled	71	278
Copper Vista	Active	79	206
Cottonwood Ranch	Active	122	757
Countrywalk Estates	Active	25	67
Coyote Springs	Active	2,087	7,355
DesertColor	Anticipated	8,560	38,000
Desert Crossing	Active	80	249
Desert Sky Ranch	Anticipated	109	75
Desert Views	Entitled	36	201
Dominion Creek	Anticipated	48	202
Eagle Meadows at Casa Grande	Entitled	756	542
Elaine Farms	Entitled	308	531
Fairbrook Meadows	Entitled	21	127
Francisco Grande	Entitled	682	2,678
G Diamond Ranch	Active	63	1,256
Ghost Hollow Estates	Entitled	80	100
Ghost Ranch	Built Out	32	125
Ghost Ranch II	Active	67	235
Gila Buttes	Anticipated	151	502

Table 3.9 Continued

Name	Status	Total Acres	Total Dwelling Units
PINAL COUNTY			
Casa Grande MPA			
Grande Valley	Construction	1,789	1,072
Grande Valley North	Entitled	1,880	9,824
Hacienda Highlands	Entitled	155	545
Highland Manor	Construction	77	306
Ironwood Village	Active	44	264
Legends	Entitled	7,017	23,058
Los Portales	Active	66	220
Lusitano	Entitled	131	79
Marabella	Entitled	388	275
McCartney Center	Active	319	1,068
McCartney Ranch	Active	164	1,314
McCartney Ranch II	Active	323	708
Mesquite Trails	Entitled	72	159
Mission Park	Entitled	323	245
Mission Por del Rio	Entitled	246	740
Mission Ranch at Casa Grande	Construction	111	344
Mission Ranch II	Entitled	61	157
Mission Royale	Active	880	1,040
Mission Valley	Built Out	109	1,131
Mountain Shadows	Entitled	374	900
Mountain View Ranch	Active	132	640
Mystic Trails	Active	17	12
Nichols Ranch	Entitled	295	285
Parks Ranch	Entitled	45	166
Rancho Val Vista	Entitled	40	186
Rodeo Crossing	Entitled	122	581
Rodeo Ranch Estates	Built Out	14	38
Santa Cruz Village	Anticipated	162	387
Sierra Ranch II	Entitled	120	798
Solana Ranch North	Entitled	691	2,356
Solana Ranch South	Entitled	577	2,030
Sonoran Heights	Entitled	266	1,060

Table 3.9 Continued

Name	Status	Total Acres	Total Dwelling Units
PINAL COUNTY			
Casa Grande MPA			
Sonoran Ranch	Entitled	317	955
Sonoran Ranch	Entitled	1	955
South Fork	Active	17	32
Southern Trails	Entitled	395	990
Springwater Pointe	Entitled	149	499
Storey and Hacienda	Entitled	117	398
Talla	Anticipated	1,284	4,298
Tamaron	Active	127	425
The Cottonwoods	Active	23	61
The Greens at Casa Grande Unit IIA	Active	47	75
The Muirlands	Entitled	81	216
The Parks at The Grande	Entitled	123	620
The Reserve at Peart	Entitled	9	51
The Shops at Palm Court	Entitled	124	295
The Villages at Casa Grande	Entitled	324	554
Thude	Entitled	1,917	6,307
Tierra de Golf	Entitled	393	240
Traviano	Anticipated	2,243	6,227
Trekell Estates	Entitled	39	40
Tristan Meadows	Entitled	62	206
Tuscany	Construction	106	189
Val Vista Estates	Active	245	44
Val Vista Views	Entitled	237	54
Verde Creek	Entitled	57	334
Villa Arroyo	Entitled	207	620
Villa de Jardine	Active	27	120
Villago	Active	1,664	6,188
Villas by Mary	Entitled	11	114
Vista Canyons	Anticipated	1,000	536
Vista Ranch	Anticipated	336	1,130
Westfield Park	Anticipated	317	262

Table 3.9 Continued

Name	Status	Total Acres	Total Dwelling Units
PINAL COUNTY			
Eloy MPA			
G.C. Del Sol	Anticipated	159	129
Isom Ranch	Anticipated	561	1,889
Sierra Vista	Entitled	811	1,759
Silver Reef	Entitled	1,608	5,500
Maricopa MPA			
Alterra	Active	294	1,005
Amarillo Creek	Entitled	973	3,235
Anderson Farms (Tortosa)	Active	947	3,764
Avalea	Entitled	2,184	2,233
Cantalia	Entitled	676	2,370
Cortona	Entitled	485	1,480
Daltessa Heights	Entitled	326	932
Desert Cedars	Active	234	478
Desert Passage	Active	202	705
Dunn Ranch	Entitled	150	1,011
Eagle Shadow	Entitled	2,757	9,500
Eagle Wing	Entitled	1,324	3,037
El Rancho Santa Rosa	Active	201	720
Glenwilde	Active	636	3,066
Hartman Ranch	Entitled	624	1,769
Hidden Valley	Entitled	1,091	3,999
Homestead North	Active	650	117
Maricopa Meadows	Active	426	1,626
Maricopa Opus	Anticipated	326	788
McLean Farms	Entitled	966	2,969
McLean Ranch	Anticipated	308	837
Midway II	Entitled	1,077	328
Neely Estates	Anticipated	274	817
Palo Brea	Active	151	525

Table 3.9 Continued

Name	Status	Total Acres	Total Dwelling Units
PINAL COUNTY			
Maricopa MPA			
Papago Estates	Anticipated	663	2,250
Pecan Woods	Entitled	159	581
Province	Active	648	1,949
Rancho El Dorado	Active	331	1,326
Rancho Francisco	Entitled	162	1,850
Rancho Mirage	Construction	641	2,187
Rancho Sierra	Entitled	3,600	15,352
Rancho Verde	Anticipated	329	1,097
Red Valley Ranch	Entitled	165	575
Rio Lobo	Anticipated	639	2,104
Rubicon	Entitled	82	263
San Travasa	Entitled	335	1,527
Santa Rosa Crossing	Active	87	356
Santa Rosa Springs	Active	276	475
Senita	Active	380	1,374
Siena	Entitled	1,370	4,762
Sorrento	Construction	638	2,127
Stanfield Ranch	Anticipated	2,241	7,518
Sunset Canyon	Entitled	338	1,225
The Villages at Rancho El Dorado	Active	527	1,939
Venida	Entitled	164	502
Verde Grande Village	Entitled	1,208	3,735
Pinal County (unincorporated)			
Dugan Fields	Anticipated	1,262	4,222
Santa Cruz Ranch	Entitled	1,895	6,288
Vintage Estates	Entitled	323	960

Source: Community Master Plans/Land Use Maps 2002-2007; table compilation complete as of May 2007.

Figure 3-25 Planned Developments

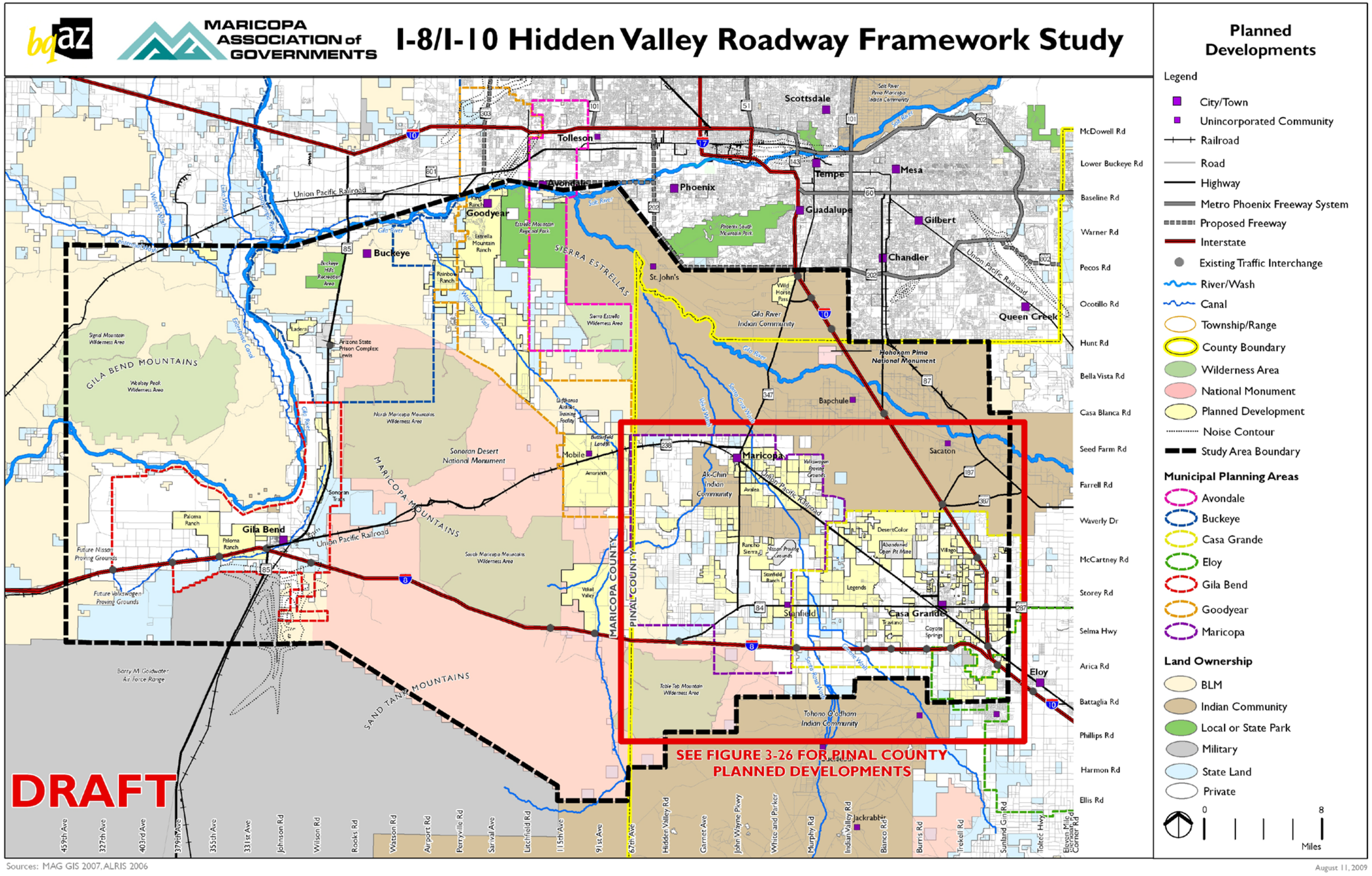
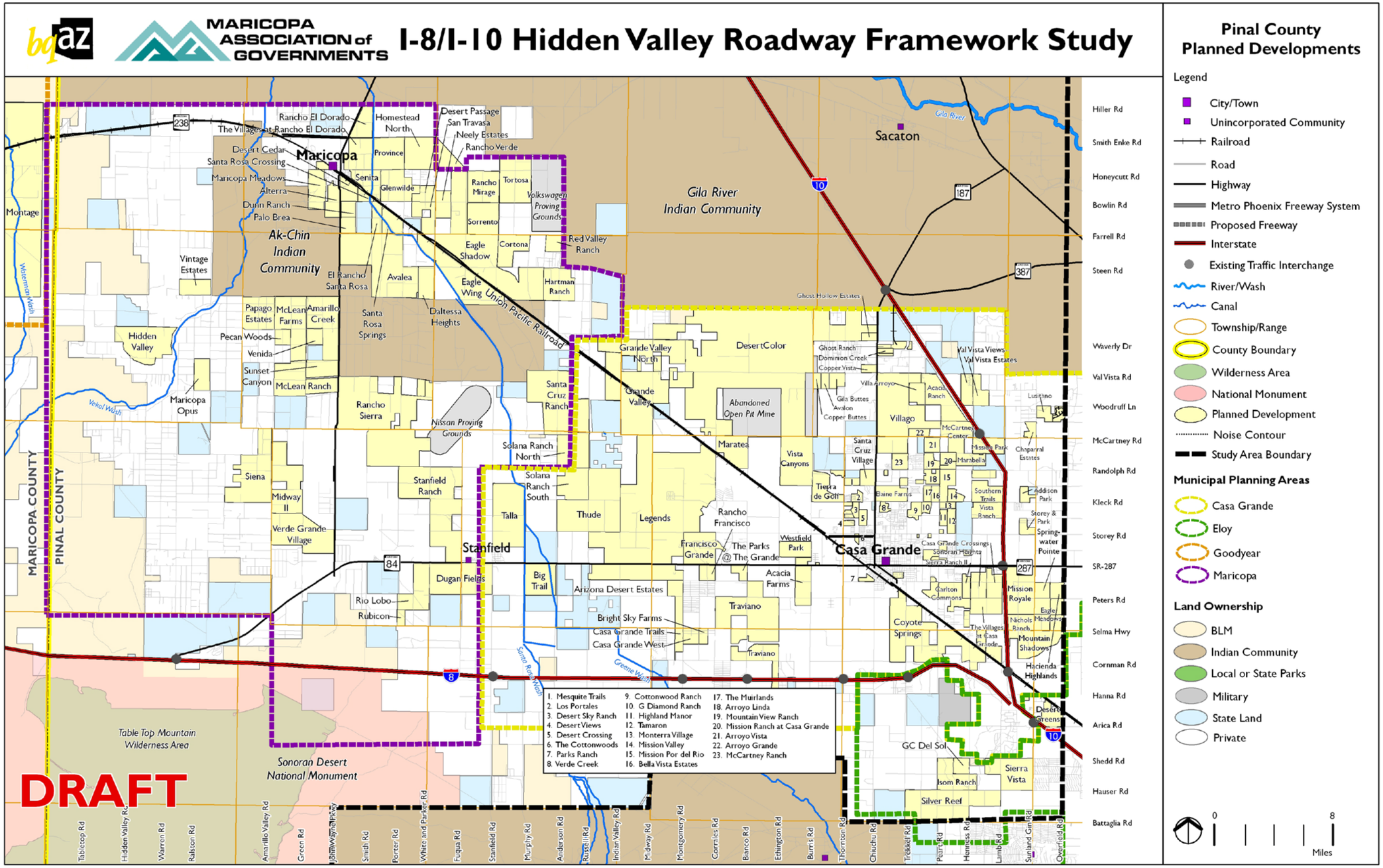


Figure 3-26 Pinal County Planned Developments



3.8 Socioeconomic Characteristics

3.8.1 Existing (Year 2005) Population and Employment

Population and employment statistics from the MAG Socioeconomic Projections of Population, Housing and Employment, May 2007, show the study area to contain approximately 21,600 persons, 6,100 dwelling units and 8,400 jobs in the 96 Socioeconomic Analysis Zones (SAZ) within Maricopa County. SAZs in the Phoenix MPA bordering the GRIC were not included in the analysis, as the overlap with the study area is negligible. Figures 3-27 and 3-28 illustrate the population and employment distribution in the Maricopa County portion of the study area in 2005. Pinal County had 68,500 residents, 29,000 dwelling units and 41,000 jobs.

3.8.2 Year 2030 Socioeconomic Projections by Community and SAZ

Figures 3-29 and 3-30 show the projected population and employment distribution in 2030. MAG projections show that the study area will have grown to a population of 448,000 (compare to 90,000 in 2005) and 224,000 jobs (compare to 49,000). High growth is projected in the central portion of the study area from Goodyear down to Mobile along Waterman Wash and reaching I-8. The area around the Arizona State Prison Complex at Lewis in the Buckeye MPA will also experience substantial population growth. In Pinal County, growth will be concentrated in the western portion, around the communities of Maricopa and Stanfield. However, CAAG has been conducting a population projections study for Pinal County, so the current projections are tentative.

Employment distribution patterns in 2030 will be similar to the population distribution. Jobs will be concentrated within the MPAs of Gila Bend, Goodyear and Avondale, and in the unincorporated community of Mobile. These pockets of high employment growth can be attributed to the high-density, mixed-use town center developments proposed in many master-planned communities in the study area. Employment will also grow in the GRIC near Avondale and south of the Phoenix MPA along I-10. This can be attributed to the Wild Horse Pass Resort and the Lone Butte Industrial and Business Park on the reservation. In Pinal County, employment growth is concentrated along the UPRR railroad/SR-238 in Maricopa, at the Nissan Proving Grounds in Maricopa, and on the Ak-Chin Indian Community. With the exception of the casino and resort development on the Ak-Chin Indian Community, much of the other employment growth is dedicated to business and industrial development.

Table 3.10 summarizes the best currently available data on population, dwelling units and employment for 2005, 2030 and Buildout conditions.

Table 3.10 Estimated Population, Dwelling Units and Employment

Year	Study Area Population			Study Area Dwelling Units			Study Area Employment		
	Maricopa	Pinal	Total	Maricopa	Pinal	Total	Maricopa	Pinal	Total
2005	21,600	68,500	90,100	6,100	29,000	35,100	8,400	41,000	49,400
2030	249,200	198,900	448,100	96,900	90,900	187,800	103,300	120,800	224,100
Buildout	882,500	1,586,600	2,469,100	355,200	595,800	951,000	298,200	797,400	1,095,600

Sources: MAG 2007 socioeconomic projectoins, Pinal County 2003 placeholder projections, MAG Buildout projections based on future land use (June 2007), CAAG Buildout projections projections (August 2007)

3.9 Existing and Planned Roadway System

A limited transportation network exists in the Hidden Valley. I-10 and I-8 are the only Interstate highways and the only freeways in the study area. I-10, located near the eastern edge of the study area, follows a north-south alignment between Phoenix and Casa Grande, and then curves east through Eloy. I-8, which begins at I-10, follows an east-west alignment along the southern edge of the study area. Several other state routes provide regional mobility. The city of Maricopa roadway network is currently being planned as a part of the Maricopa Regional Transportation Plan Update and will use the section-line grid pattern. A section-line grid network also exists in the Casa Grande area. Some elements of the grid are in place in Gila Bend and will eventually be implemented within the Sonoran Valley Planning Area in Goodyear.

The National Highway System (NHS) is a federally designated network consisting of key intercity roadways throughout the United States. It includes the entire Interstate highway system and selected non-Interstate routes. These routes are eligible for specially dedicated NHS funds as well as other federal highway funding. In addition to I-8 and I-10, SR-85 from I-8 to I-10 is on the system.

Figure 3-27 Total Population in 2005 by Socioeconomic Analysis Zone (SAZ)

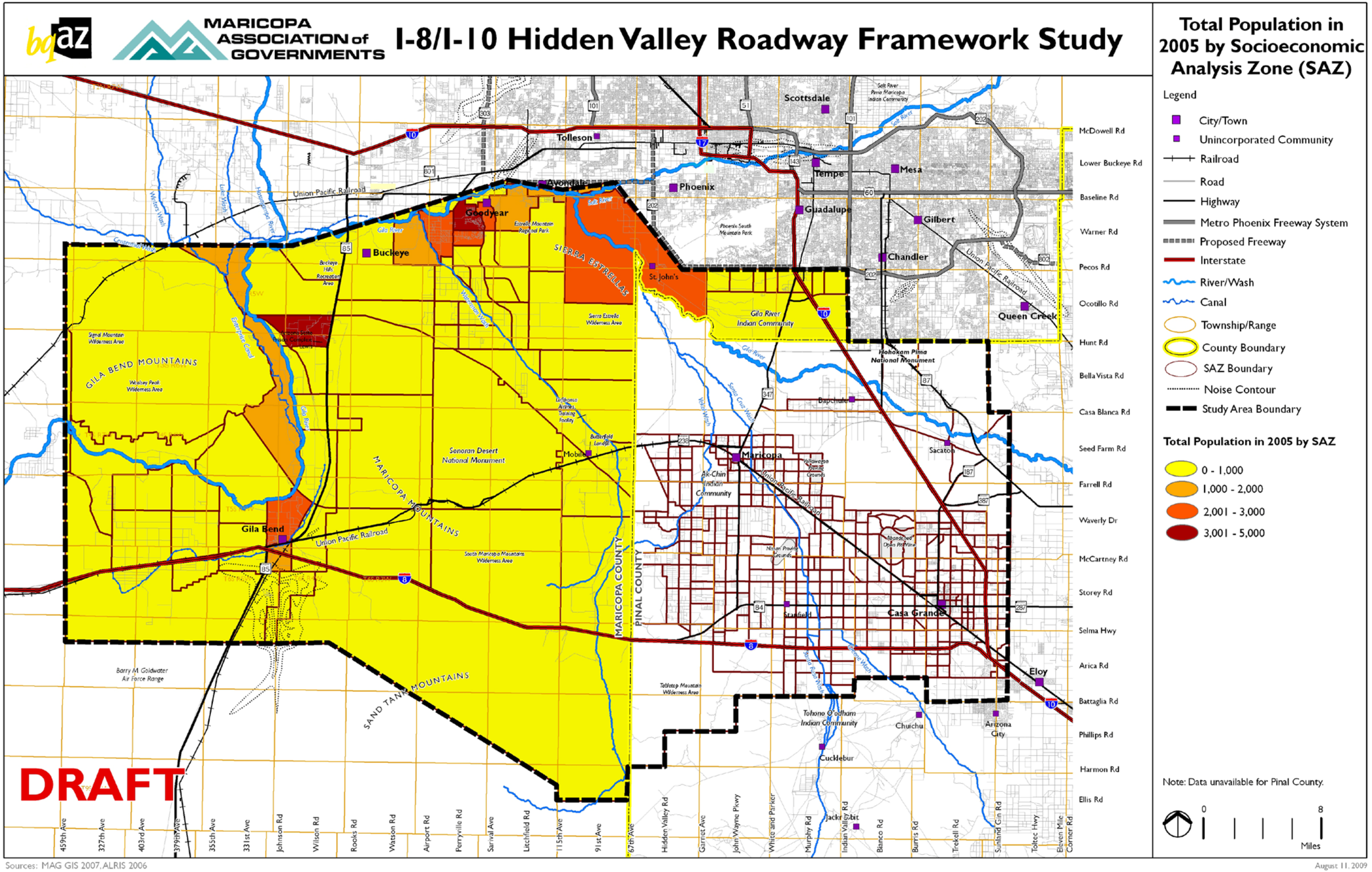


Figure 3-28 Total Employment in 2005 by Socioeconomic Analysis Zone (SAZ)

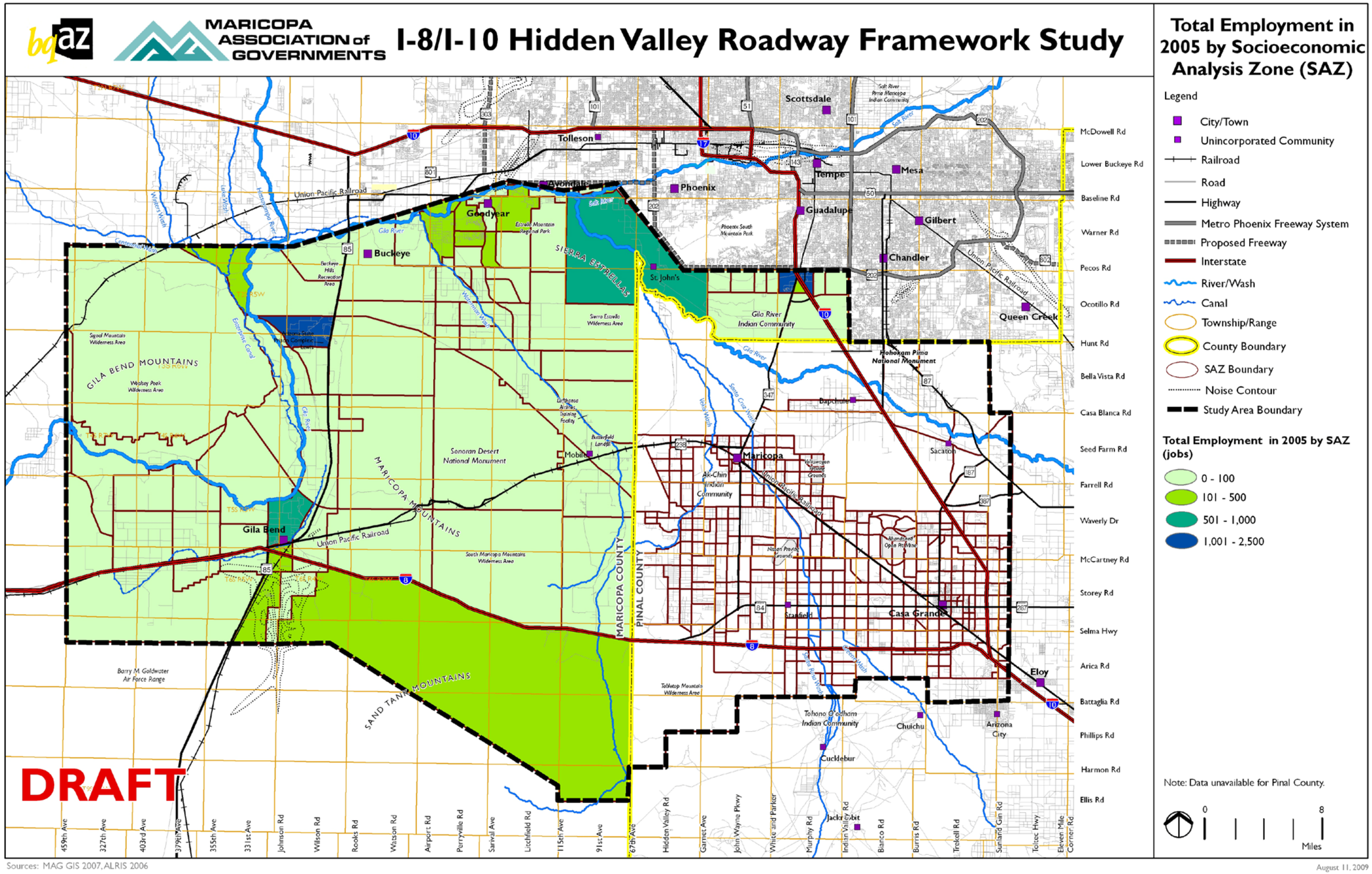


Figure 3-29 Total Population in 2030 by socioeconomic Analysis Zone (SAZ)

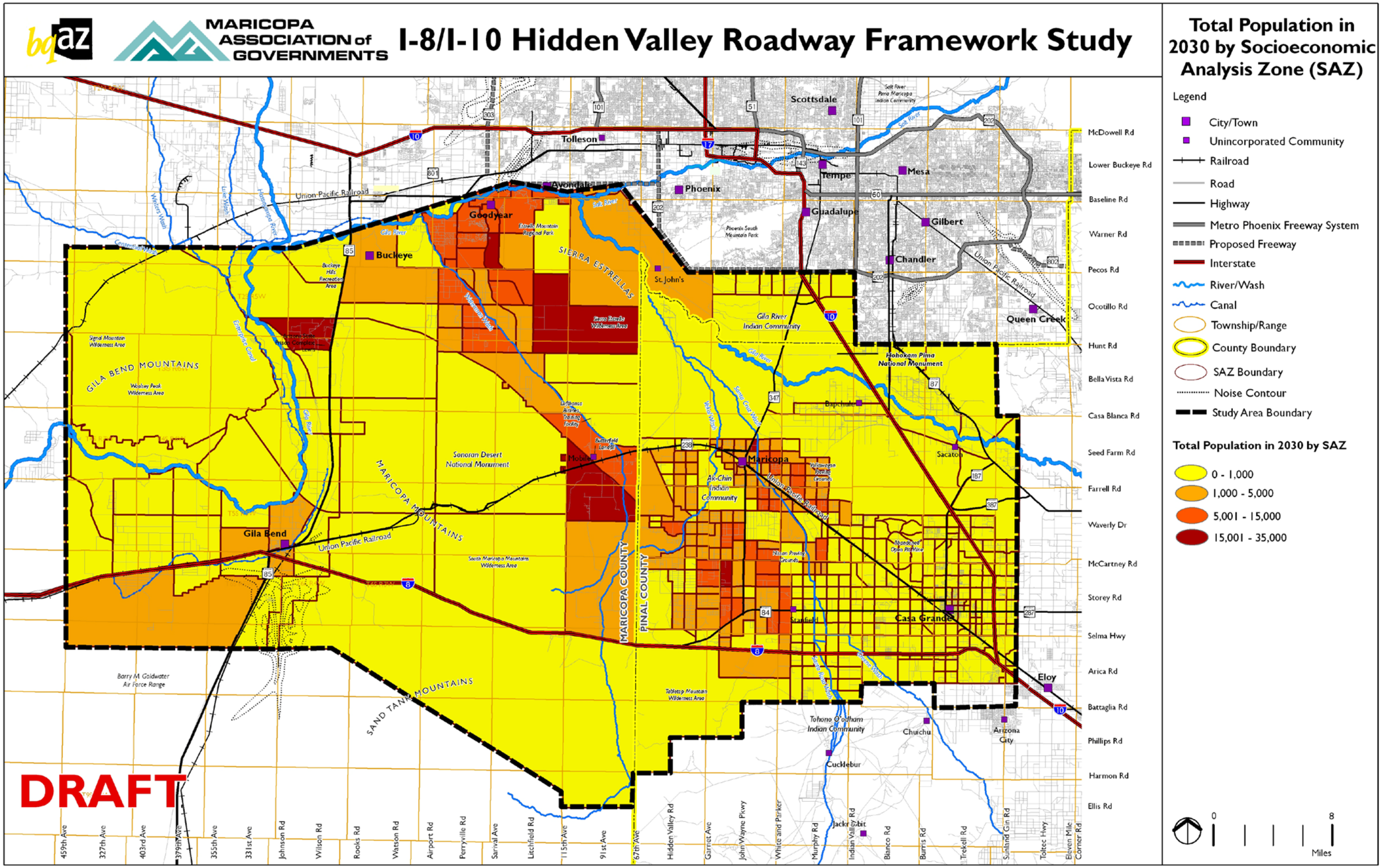
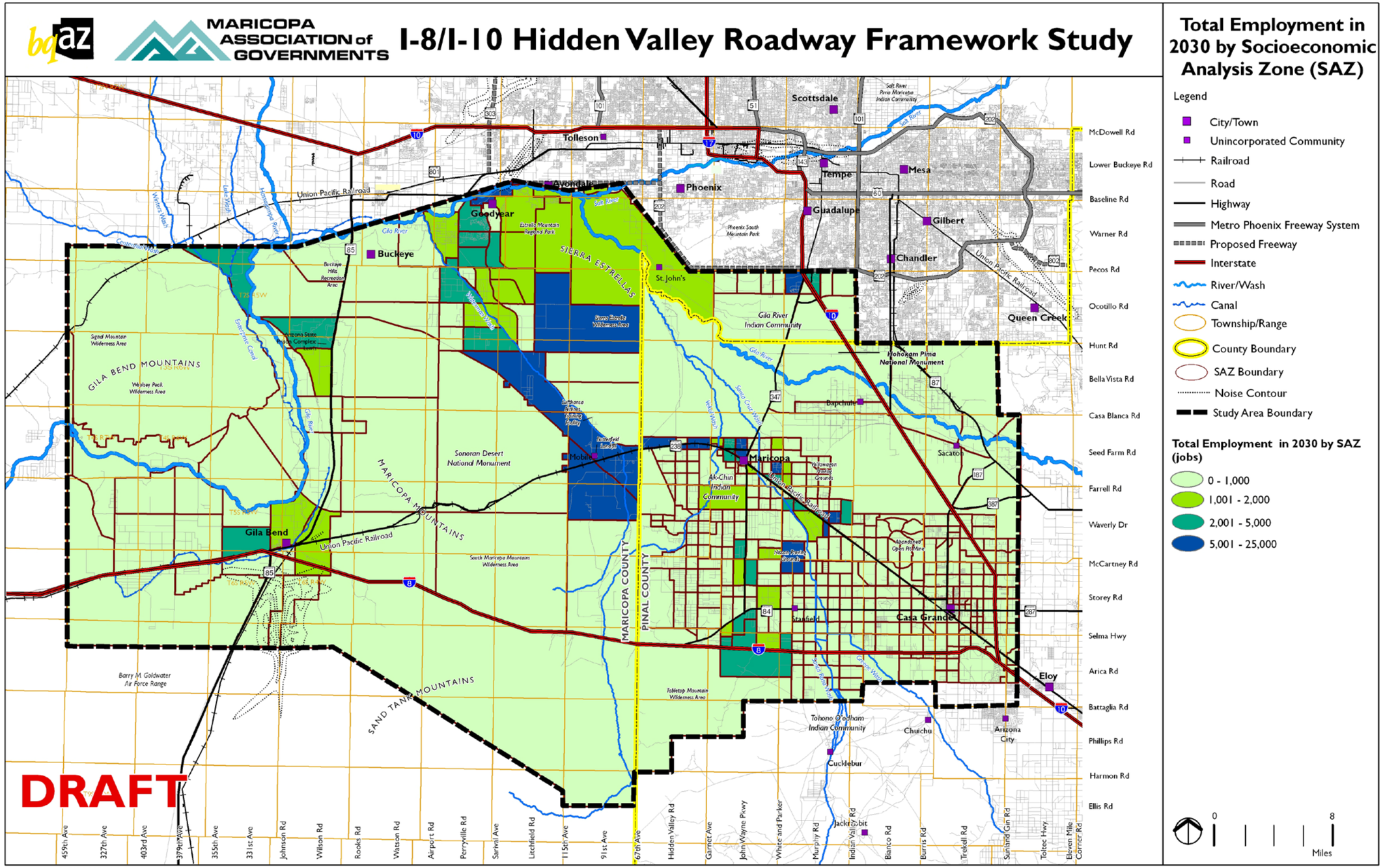


Figure 3-30 Total Employment in 2030 by Socioeconomic Analysis Zone (SAZ)



ADOT is developing a statewide Aceess Management Program that will provide guidance for all state highways. Completion is scheduled for 2008.

3.9.1 State Highways

Interstate 8

ADOT classifies this major east-west facility that crosses the entire study area as a Principal Arterial Interstate (Rural). The Pinal County Routes of Regional Significance (RSR) classifies it as a freeway. The segment from I-10 to Gila Bend, along with SR-85 from Gila Bend to I-10, is part of a designated bypass route whereby through trucks and other traffic can avoid the more congested Phoenix urbanized area.

Alignment

From its junction with I-10 southeast of Casa Grande, I-8 traverses the southern portion of the study area to about 36 miles west of Gila Bend.

Typical Section

I-8 through the study area is composed of four general purpose lanes (two in each direction) with an open median landscaped with native vegetation. Traffic interchanges (TIs) consist of a mix of underpasses and overpasses. The majority of TIs have been constructed in an ordinary diamond configuration which requires minimal right-of-way and usually fits within the 300-foot freeway cross-section.

Traffic Interchanges

Within the Hidden Valley study area, 15 TIs exist at the following locations, from east to west:

Milepost (MP) 178, Interstate 10 (Casa Grande, Eloy)
MP 174, S. Trekell Road (Casa Grande, Arizona City, Tohono O'odham Indian Community)
MP 172, S. Thornton Road (Casa Grande, Tohono O'odham Indian Community)
MP 169, S. Bianco Road (Casa Grande, Tohono O'odham Indian Community)
MP 167, S. Montgomery Road (Maricopa, Tohono O'odham Indian Community)
MP 161, S. Stanfield Road (Maricopa, Stanfield, Tohono O'odham Indian Community)
MP 151, W. SR-84/Gila Bend Highway (Maricopa, Casa Grande)
MP 144, S. Vekol Road
MP 140, S. Freeman Road (Sonoran Desert National Monument)
MP 119, S. Butterfield Trail (Gila Bend, Buckeye, Phoenix metropolitan area)
MP 115, SR-85 (Gila Bend, Buckeye, Phoenix metropolitan area)
MP 111, S. Citrus Valley Road (Gila Bend)
MP 106, S. Paloma Road (Theba, Gila Bend)
MP 102, Painted Rock Dam Road
MP 87, S. Agua Caliente Road (Sentinel)

The city of Casa Grande has identified a possible location for an interchange at the Henness Road alignment. No decision has been made, however. Any new or modified interchanges on Interstate highways require advance written approval from ADOT and FHWA.

Access Management

I-8 is a fully access-controlled facility. Because I-10 is an Interstate highway, a Change of Access Report must be approved by ADOT and FHWA before construction of any new TI.

Plans for Improvement

The proposed widening of I-10 south of Selma Highway/Jimmie Kerr Boulevard in Casa Grande would include changes to I-8, including a potential new interchange at Henness Road. (See I-10 discussion below.)

Interstate 10

I-10 is one of two freeways serving the study area and is classified by ADOT as a Principal Arterial Interstate (Rural). The Pinal County RSR classifies it as a freeway. I-10 is one of the few continuous, coast-to-coast Interstates in the nation. I-10 serves as a principal truck freight route and is the primary link between the Phoenix and Tucson metropolitan areas. It is heavily traveled and, as its name implies, much of the traffic is involved in interstate travel. FHWA has designated the entire length of I-10 from Los Angeles to Jacksonville as a "corridor of the future."

Alignment

This segment of I-10 crosses the entire study area in a predominantly north-south direction.

Typical Section

I-10 through the study area is composed of four general purpose lanes (two in each direction) with an open median landscaped with native vegetation. TIs consist of a mix of underpasses and overpasses. The majority of TIs have been constructed in an ordinary diamond configuration which requires minimal right-of-way and usually fits within the 300-foot freeway cross-section.

Traffic Interchanges

Within the Hidden Valley study area, nine TIs exist at the following locations, from south to north:

MP 200, Sunland Gin Road (Arizona City, Eloy)
MP 199, West Interstate 8 (Yuma, San Diego)
MP 198, Jimmy Kerr Boulevard (Casa Grande)
MP 194, SR-287/E. Florence Boulevard (Casa Grande, Coolidge, Florence)
MP 190, McCartney Road (Central Arizona College and Casa Grande Regional Airport)
MP 185, SR-187 and SR-387 Junction (Sacaton, Florence)
MP 175, SR-587 (Casa Blanca Road, Sacaton, Chandler, Gilbert)
MP 167, Riggs Road (Sun Lakes)
MP 164, SR-347/Queen Creek Road (Chandler, Ak-Chin Indian Community, city of Maricopa)

Access Management

I-10 is a fully access-controlled facility. Because I-10 is an Interstate highway, a Change of Access Report must be approved by ADOT and FHWA before construction of any new TI.

Plans for Improvement

ADOT is currently conducting a Design Concept Report (DCR) and Environmental Assessment (EA) to identify long-term improvements for 41 miles of I-10 from I-8 to Tangerine Road at milepost 240 in Marana. The goal of the DCR and EA is to establish a plan to guide the development of I-10 through the year 2030. These concurrent studies will produce an access management plan and design concept report for this section of I-10. Completion is scheduled for June 2009. In addition, ADOT is conducting a DCR and Environmental Assessment to determine the feasibility of widening 1-10 from SR-202 to I-8, a distance of 38 miles. The majority of this segment lies within the Gila River Indian Community. These two studies together encompass all of I-10 within the Hidden Valley study area.

State Route 84

State Route 84 (SR-84) was once the principal east-west highway between Casa Grande and Yuma. Although I-8 has replaced it in this capacity, SR-84 remains on the state highway system as a Major Collector (Rural). Pinal County has designated it as an RSR.

Alignment

This highway extends from Casa Grande to I-8 by way of Stanfield. It parallels I-8 for approximately 17 miles, and then turns southwest at SR-347 to meet I-8 approximately 23 miles west of Casa Grande. West of Pinal Avenue in Casa Grande, this roadway is known as the Gila Bend Highway.

Typical Section

SR-84 is a two-lane road from I-8 to Fuqua Road, where it transitions to a four-lane divided highway with left-turn bays. This cross-section continues through the community of Stanfield for approximately 1.4 miles. SR-84 continues as a two-lane roadway to about one-quarter mile west of Burris Road, where the highway becomes a four-lane roadway with a continuous left-turn lane. It is constructed as a four-lane divided roadway east and west of the UPRR crossing. East of the UPRR alignment, SR-84 is a four-lane highway with continuous left-turn lane and some dedicated right-turn bays.

Major Intersections

- Signalized Intersections
  - Thornton Road
  - N. Pinal Avenue
- Unsignalized Intersections
  - SR-347
  - Smith Road
  - White and Parker Road
  - Fuqua Road
  - Anderson Road
  - Bianco Road
  - Ethington Road

Access Management

Currently, no access management guidelines are stipulated for SR-84.

Plans for Improvement

ADOT currently has no plans to improve SR-84.

State Route 85

ADOT classifies SR-85 from I-8 to I-10 a Principal Arterial Other (Rural). ("Other" means not an Interstate highway.) SR-85 is a frequently used truck bypass route around metropolitan Phoenix. It has also been recommended as a segment of the proposed CANAMEX Corridor being developed in response to the North American Free Trade Agreement (NAFTA). The CANAMEX Corridor will provide a continuous, high-capacity international trade route between Nogales, Sonora, Mexico through Las Vegas and ultimately to Canada.

SR-85 also provides access from the western portion of metropolitan Phoenix to Yuma, San Diego and Puerto Penasco (Rocky Point), Sonora. There is currently little development along SR-85 south of the Gila River. The Lewis Prison and Southwest Regional Juvenile Correctional Facility are located about ten miles south of the river, and the town of Gila Bend is located the highway's junction with I-8. However, a significant increase in development has occurred in recent years within the town of Buckeye, which has expanded its boundaries to the south. This development is expected to continue after the improvement of SR-85 to a four-lane highway from I-8 to I-10.

Alignment

Within the Hidden Valley study area, SR-85 extends north from Gila Bend to the Gila River and continues to I-10 in Buckeye.

Typical Section

Until recently, all of SR-85 within the study area was a two-lane undivided highway. However, ADOT is now widening the 34-mile segment north of I-8, in a project funded as part of the MAG Regional Transportation Plan (RTP). As of August 2007, more than half of this segment is now a four-lane divided segment with a rural open median. The remainder is still a two-lane undivided highway until ADOT finishes the widening project. Ultimately this corridor is envisioned as a freeway, although funding for future freeway construction is not provided in the RTP.

Location of Future Traffic Interchanges

The SR-85 Interim Access Management Study, prepared for ADOT in 2005, lists 14 TIs along this highway between I-10 and I-8. Some of these TIs are proposed at existing roadway intersections, while others will serve intersecting roads yet to be constructed. The planned TIs are listed in Table 3.11. Most will initially be constructed as at-grade intersections, to be upgraded to TIs when traffic volumes warrant and funding is secured by private developers.

Table 3.11 SR-85 Recommended Full Access Locations

Milepost	Description	Recommendation
MP 120.84	Maricopa Road	At-Grade Intersection/Future Interchange Location
MP 123	Watermelon Road	At-Grade Intersection/Future Interchange Location
MP 128	BLM Access	At-Grade Intersection/Future Interchange Location
MP 133.9	Woods Road	At-Grade Intersection/Future Interchange Location
MP 136	Local Access	At-Grade Intersection/Future Interchange Location
MP 138.3	Lewis Prison Interchange	Existing Interchange
MP 140.9	Riggs Road	At-Grade Intersection/Future Interchange Location
MP 144	Buckeye Hills Recreation Access	At-Grade Intersection/Future Interchange Location
MP 147	Robbins Butte Wildlife Area Access	At-Grade Intersection/Future Interchange Location
MP 149.3	Hazen Road	At-Grade Intersection/Future Interchange Location
MP 150.5	MC-85	At-Grade Intersection/Future Interchange Location
MP 151*	Baseline Road	At-Grade Intersection/Future Interchange Location
MP 152	Southern Avenue	At-Grade Intersection/Future Interchange Location
MP 153	Broadway Road	At-Grade Intersection/Future Interchange Location
MP 154**	Lower Buckeye Road	At-Grade Intersection

*Baseline Road will access only SR-85 frontage roads when mainline is constructed.
**Lower Buckeye Road may be realigned to a mid-mile crossing with no SR-85 access.
Source: State Route 85, Business 08 Access Management Study

Access Management

The ultimate facility recommendation for SR-85 is for a fully access-controlled highway built to freeway standards. Access to and from the highway will be provided only at grade-separated TIs that correspond to the locations of recommended interim at-grade intersections. Because of funding limitations, however, ADOT has opted to construct an "interim," four-lane divided highway with access limited to selected at-grade intersections. The SR-85 Access Management Plan includes specific construction projects to meet this objective.

The access management plan has been designed for compatibility with the ultimate freeway design, even if the transition from divided highway to freeway requires many years. "With the exception of the proposed TIs at Buckeye Hills Recreation Area and Robbins Butte Wildlife Area, it is anticipated that all of the future TIs on this segment of SR-85 will be constructed with the cross road over the mainline. This configuration will allow the construction of the TIs without adversely affecting the operation of the mainline roadway." "Implementation of the recommended ultimate access management plan will be dependent on adjacent development, and the general growth of the area. Further, construction of the proposed TIs cannot be accomplished without public or private funding. Therefore, these are considered long-range improvements.

Plans for Improvement

ADOT has identified 12 interim construction priorities in coordination with MAG. A new four-lane divided roadway will be constructed from MP 120.84 to MP 123. Business 8 will be improved to a four-lane arterial from Maricopa Road to the Gila Bend TI on I-8. Two new lanes will be constructed from MP 122.99 to MP 142.50 west of the existing highway and striped to provide southbound lanes. From MP 142.50 to the Gila River, two new lanes will be constructed east of the existing highway and striped to provide northbound lanes. ADOT has committed more than $100 million of RTP funds over five years for the interim projects that will provide a four-lane divided section. Ultimately the 37-mile corridor will require a total of nearly $300 million. The initial construction includes two new TIs at the Lewis Prison (recently completed) and MC-85.

State Route 87

Pinal County has designated SR-87 as a RSR from North Curry Road to I-10. ADOT classifies it as a Minor Arterial (Rural). This highway serves the Sacaton and Santan communities on the GRIC. Although largely replaced as a north-south route in central Arizona by I-10, SR-87 is a major access route for the GRIC. It is also an important detour route when incidents require temporary closure of I-10.

Alignment

SR-87 runs almost parallel to I-10 from southeast to northwest, diagonally near the eastern edge of the study area. It is relatively straight except where it bends to the east around the Santan farming community. It terminates at the northern boundary of the GRIC at Hunt Highway, just east of SR-587/Arizona Avenue.

Typical Section

The roadway is built to a standard two-lane cross-section with shoulders. Right-of-way varies through the length of this route within the study area.

Major Intersections

- Signalized Intersections
  - E. Hunt Highway/SR-587
- Unsignalized Intersections
  - N. Stotonic Road/BIA-28/Gilbert Road (Stotonic, Gilbert)
  - BIA-68/Santan Road (Santan, Sacaton)
  - BIA-7/Sacaton Road (Sacaton)
  - BIA-84/E. River Road (Sacaton)
  - BIA-1/Sacaton Road (Sacaton)
  - SR-187 (Casa Grande, Sacaton)
  - SR-387 (Casa Grande)

Access Management

Currently, no access management guidelines are stipulated for SR-87.

Plans for Improvement

ADOT currently has no plans to improve SR-87.

State Route 187

Pinal County classifies SR-187 as a RSR, while ADOT classifies it as a Minor Collector (Rural). It connects SR-387 and I-10, north of Casa Grande, to SR-87, which diagonally traverses the eastern side of the study area. All of SR-187 lies within the GRIC. SR-187 is a key route to Casa Grande for residents of the GRIC Sacaton and Santan communities. SR-187, along with SR-387, offers an outlet for I-10 traffic incident management purposes.

Alignment

SR-187 begins at its junction with SR-387 just east of I-10 (at MP 185) north of Casa Grande. The roadway extends northeast approximately 5.5 miles to a junction with SR-87, the old Phoenix to Tucson route.

Typical Section

SR-187 is a two-lane highway with shoulders developed in a 60-foot right-of-way.

Major Intersections

Unsignalized
- SR-87 (Coolidge, Chandler, Phoenix)
- BIA-7 (Sacaton)
- SR-387 (I-10, Casa Grande)

Access Management

Currently, no access management guidelines are stipulated for SR-187.

Plans for Improvement

ADOT currently has no plans to improve SR-187.

State Route 238

SR-238 is classified as a Minor Collector (Rural) by ADOT, as a Parkway in the Pinal County RSR, and as a Minor Arterial by Maricopa County. SR-238 links the city of Maricopa at SR-347 with the town of Gila Bend at SR-85. The westernmost 25 miles of SR-238 are operated and maintained by the Maricopa County Department of Transportation (MCDOT). Between SR-347 and three miles west of the community of Mobile in Maricopa County, SR-238 is an official State highway. From this point, at the eastern boundary of the Sonoran Desert National Monument to Gila Bend, the roadway is a MCDOT road. Within the city of Maricopa, this route is known as W. Smith Enke Road. SR-238 parallels the UPRR alignment from Garvey Avenue in Maricopa (two miles west of SR-347) to Gila Bend.

Alignment

Although some maps and road signs indicate that SR-238 extends from Maricopa to Gila Bend, not all of this roadway belongs to the state highway system. The roadway originally was a dirt road linking Gila Bend with Maricopa. A portion was upgraded to a state highway to serve a proposed hazardous waste management facility west of Mobile, approximately 13.5 miles west of Maricopa.

Typical Section

The typical cross-section for SR-238 is a two-lane undivided highway constructed within a 60-foot right-of-way, expanding to 80 feet at some major intersections. The highway is a two-lane divided roadway with a partially continuous left-turn lane for one mile west of SR-347 in the city of Maricopa.

Major Intersections

Signalized
- SR-347

Unsignalized
- Ralston Road
- N. Rio Bravo Road
- S. 83rd Avenue
- S. 91st Avenue
- S. 99th Avenue

Access Management

Currently, no access management guidelines are stipulated for SR-238.

Plans for Improvement

The city of Maricopa Regional Transportation Plan (RTP) identifies a project to improve SR-238 from SR-347 to the city limit at Kiva Road. The improvements would upgrade the roadway to a six-lane divided principal arterial sometime between fiscal year (FY) 2011 and FY 2025.

State Route 287/E. Florence Boulevard

SR-287 is classified as a Minor Arterial (Rural) by ADOT and as a RSR by Pinal County. This route is a predominantly east-west state highway, serving communities in central Arizona.

Alignment

Only a short stretch of SR-287 is within the Hidden Valley study area. SR-287 begins at SR-387 on the western side of Casa Grande near the UPRR, and extends 14 miles east to a junction with SR-87. In Casa Grande, SR-287 is known as E. Florence Boulevard.

Typical Section

From its junction with SR-387 to one-half mile east of I-10 at S. Sunland Gin Road/N. Hacienda Road, SR-287 is a four-lane roadway with a continuous left-turn lane and left-turn bays at major intersections. Some major intersections also have right-turn bays. East of S. Sunland Gin Road/N. Hacienda Road, SR-287 is a two-lane roadway. The right-of-way for SR-287 varies from 80 feet in the older part of Casa Grande near SR-387 and the UPRR, to 100 feet in the newer area of the city close to I-10 and east of 1-10 to SR-87.

Major Intersections

- Signalized
  - MP 194, I-10 East
  - MP 194, I-10 West
  - N. Henness Road
  - N. Arizola Road
  - N. Peart Road
  - N. Colorado Street
  - N. Pueblo Drive
  - N. Trekell Road
  - N. Cameron Avenue
  - N. Olive Avenue
  - SR-347/N. Pinal Avenue
- Unsignalized
  - Overfield Road
  - S. Sunland Gin Road/N. Hacienda Road
  - S. Biscayne Road
  - N. Pottlebaum Road

Access Management

Within the city of Casa Grande new development must follow the design standards of Title 16 of the Casa Grande Subdivision Ordinance.

Since ADOT controls the functionality of the roadway, the city is encouraged to coordinate with ADOT regarding land use decisions and access. Currently, no access management guidelines are stipulated for SR-287 outside the Casa Grande city limits. Currently, no access management guidelines are stipulated for SR-287.

Plans for Improvement

ADOT currently has no plans to improve SR-287.

State Route 303

SR-303, an element of the MAG regional freeway system, does not have an existing alignment in the study area. The MAG RTP funds right-of-way preservation for a future SR-303 freeway from the proposed SR-801 freeway (near MC-85) south to Riggs Road. Goodyear's Circulation Framework for the Sonoran Valley Planning Area suggests extending SR-303 from SR-801 south to I-8, but such an extension is not funded or part of the RTP.

Access Management

SR-303 will be a fully accessed-controlled (freeway) facility when the ultimate section in the study area (from the Gila River to Riggs Road) is constructed.

State Route 347/Maricopa Road

SR-347 is a north-south Minor Arterial (Rural) in western Pinal County. The county RSR system classifies this route as a Parkway from SR-84 to I-10. It is known as N. John Wayne Parkway in Maricopa and as N. Maricopa Road north of the city.

Alignment

SR-347 begins at I-8 and runs through the GRIC, Maricopa and the Ak-Chin Indian Community to SR-84.

Typical Section

SR-347 is predominantly a four-lane divided highway, but numerous segments deviate from this cross-section. It is a two-lane roadway from SR-84 north to W. Meadowview Road. It becomes a four-lane divided highway at W. Meadowview Road and continues as such to W. Juan Street. The route's cross-section becomes five lanes (three southbound and two northbound) from W. Juan Street to Bowlin Road. The route has six lanes one-quarter mile north of Bowlin Road. One-fourth mile north of Bowlin Road, the road transitions to a four-lane roadway with a continuous left-turn lane to Edison Road. At Edison, the route becomes a five-lane divided highway (three lanes northbound and two southbound) for one-eighth mile. SR-347 then becomes a six-lane highway with left and right turn lanes. It remains a six-lane highway to W. Smith Enke Road. North of that intersection, the route becomes a five-lane highway again (three southbound and two northbound). This cross-section continues to Cobblestone Farms Drive, where the roadway transitions to four-lane divided highway through the GRIC.

Major Intersections

- Signalized Intersections
  - Rancho El Dorado/Cobblestone Farms Drive-North
  - Cobblestone Farms Drive-South
  - W. Smith Enke Road/SR-238
  - Edison Road
  - Maricopa-Casa Grande Highway
  - Honeycutt Avenue
  - Alterra Parkway
  - Bowlin Road
  - Harrah's Ak-Chin Casino
- Unsignalized Intersections
  - Hathaway Avenue
  - W. Honeycutt Road
  - Farrell Road
  - Peters and Nall Road
  - Papago Farms Road

Access Management

Within the city of Maricopa, new development must follow the design standards of Article 14-6 of the Maricopa Subdivison Ordinance. The 2008 Maricopa RTP Update contains access management guidelines by roadway functional classification.

Since ADOT controls the functionality of the roadway, the city is encouraged to coordinate with ADOT regarding land use decisions and access. Currently, no access management guidelines are stipulated for SR-347 outside of the city limits of Maricopa.

Plans for Improvement

Maricopa and ADOT recently completed a feasibility report outlining the costs, design parameters, and needed right-of-way for a grade separation of SR-347 at the UPRR grade crossing. Current plans for the roadway are to widen it to a six-lane Principal Arterial between Hiller Road and Peters and Nall Road.

State Route 387

SR-387 is classified as a Principal Arterial Other (Rural) by ADOT and as a RSR by Pinal County. It is known as N. Pinal Avenue in Casa Grande.

Alignment

SR-387 begins in Casa Grande at the junction of SR-287/Florence Boulevard and SR-84/Gila Bend Highway and continues north approximately nine miles to the junction of I-10. From the junction of 1-10, SR-387 continues east for approximately seven miles to the junction of SR-87.

Typical Section

SR-387 begins in Casa Grande as a four-lane roadway with a continuous left turn lane until approximately one-half mile north of Korsten Road. At approximately one-half mile north of Korsten Road SR-387 is a four-lane roadway with a center median until it reaches I-10. From there to SR-87, SR-387 is a typical two-lane highway with shoulders developed in a 60-foot right-of-way.

Major Intersections

Signalized
- SR-287
- McMurray Boulevard
- Cottonwood Lane
- Kortsen Road
- Rodeo Road
- Val Vista Road

Unsignalized
- Palm Avenue
- McCartney Road
- Centennial Avenue
- Havasupai Drive
- Hopi Drive
- SR-187 (Casa Grande, Sacaton)
- SR-87 (Phoenix, Chandler, Coolidge, Eloy, Tucson)

Access Management

SR-387 is access-controlled from one-half mile north of Korsten Road to I-10. Access is controlled by a landscaped center median.

Currently, no access management guidelines are stipulated for SR-387 from junction I-10 to SR-87. Currently, no access management guidelines are stipulated for SR-387.

Plans for Improvement

ADOT currently has no plans to improve SR-387.

3.9.2 Other Key Facilities

Old US-80

Old US-80, which was the route from Buckeye to Gila Bend before construction of SR-85, is classified as a Minor Arterial by MCDOT. This mostly north-south roadway serves Buckeye, Palo Verde, Hassayampa, Arlington, Cotton Center and Gila Bend.

Alignment

Old US-80 begins at SR-85 and proceeds west to West Salome Highway. From there the alignment turns to the southwest and follows the physiographic boundary of the Gila River to the town limits of Gila Bend.

Typical Section

Old US-80 has two lanes with shoulders.

Major Intersections (Unsignalized)

S. Wilson Avenue
S. Palo Verde Road
S. Bruner Road
S. 307th Avenue
W. Salome Highway
S. 319th Avenue
S. Arlington School Road
W. Desert Rose Road

Access Management

MCDOT has not specified specific access management guidelines for Old US-80. Any new development along Old US-80 must follow the access management guidelines set forth the *Maricopa County Major Streets and Routes Plan* Policy Document.

Plans for Improvement

MCDOT will conduct a corridor study of Old US-80 in FY 2008. This study will analyze the existing roadway and determine whether widening is necessary based on projected future growth.

Maricopa-Casa Grande Highway

Maricopa-Casa Grande Highway is currently a two-lane undivided highway from Casa Grande to a point approximately one mile southeast of the junction of SR-347 in Maricopa, where the highway becomes a four-lane facility with a continuous left-turn lane, two northbound lanes and one southbound lane. The route continues northwest as a four-lane highway for approximately one-half mile, where it narrows to one northbound lane, one southbound lane, and a continuous left-turn lane to its terminus at SR-347 in Maricopa.

According to the Pinal County Functional Classification Map approved by FHWA, Maricopa-Casa Grande Highway is classified as a rural minor arterial. This highway runs parallel to the UPRR in a diagonal (southeast to northwest) direction. The Maricopa RTP recommended improving the Maricopa-Casa Grande Highway to a six-lane principal arterial from SR-347 to Anderson Road, to improve mobility, enhance safety and provide access management.

Alignment

The proposed improvements would be constructed along the existing alignment of the current roadway.

Typical Section

The majority of the existing typical section has two lanes with shoulders. The proposed typical section consists of six lanes with a landscaped median.

Major Intersections

The following major intersections exist along the Maricopa-Casa Grande Highway:

SR-347 (signalized)
Stonegate Road (signalized)
Shea Way (signalized)
N. Porter Road (signalized)
SR-387 (Pinal Avenue—signalized) in Casa Grande
Maricopa Groves Parkway (unsignalized)
Santa Rosa Parkway (unsignalized)
White and Parker Road (unsignalized)
Hartman Road (unsignalized)
Murphy Road (unsignalized)
Russell Road (unsignalized)
Anderson Road (unsignalized)
Val Vista Road (unsignalized)

Access Management

The 2008 Maricopa RTP Update contains two classes of principal arterials, with the first having a higher level of access management than the second. The RTP recommends a second-level principal arterial classification for the Maricopa-Casa Grande Highway. The following access management guidelines apply to the Principal Arterial 2 facilities:

- Intersection spacing: one-fourth mile minimum, one-half mile desirable
- Limited private direct access
- Driveway spacing: minimum one-fourth mile for left out, 450 feet for right-in/out
- Turn lanes may be required for private access

3.9.3 Proposed Future Facilities

Proposed Hassayampa North-South Freeway

As part of the I-10/Hassayampa Valley Transportation Framework Study, the Hassayampa North-South Freeway was identified as a potential future freeway extending into the Hidden Valley study area.

Alignment

The proposed Hassayampa Freeway corridor south of I-10 is located generally between the 347th and 339th Avenue alignments. The proposed alignment proceeds south along the west side of Luke Wash and turns east at the Riggs Road alignment. It then proceeds in a southwesterly direction following the northern boundary of the Sonoran Desert National Monument and terminates at SR-238 near Mobile. This description represents a generalized corridor only. A specific alignment will be determined in future studies.

Access Management

The Hassayampa North-South Freeway will ultimately be a fully access-controlled (freeway) facility if constructed.

Proposed Val Vista Expressway (Casa Grande)

The Val Vista Expressway was identified for further study as a new expressway in the 2007 Casa Grande SATS to provide east-west mobility between I-10 and Montgomery Road. (The city of Casa Grande expressway concept is defined in Table 3.16.)

Alignment

The corridor for the proposed expressway generally follows Val Vista Road, beginning at I-10 and ending at Montgomery Road. No alignment has been set, however.

Typical Section

The expressway is envisioned as a six-lane facility requiring 300 feet of right-of-way.

Traffic Interchanges

Proposed future TIs are located at Pinal Avenue, Burris Road, and Bianco Road. Future proposed system interchanges are located at I-10 and Montgomery Road. Future overpass crossings are at Corales Road and Sacaton Highway.

Access Management

Recommended access management guidelines for this facility are provided in Appendix C of the 2007 Casa Grande SATS. The guidelines recommend that the city formalize a continuous access management process to include: 1) access permitting procedures, 2) identification of responsibilities, 3) reviewing development plans, 4) coordination in planning and relocating roadways, and 5) preparing access management plans.

Proposed Montgomery Expressway (Casa Grande)

Montgomery Expressway was identified for further study as a new expressway in the 2007 Casa Grande SATS to provide north-south mobility between I-8 and the proposed Val Vista Expressway.

Alignment

The corridor for the proposed expressway generally follows Montgomery Road, beginning at I-8 and ending at the proposed Val Vista Expressway. No alignment has been set, however.

Typical Section

The expressway is envisioned as a six-lane facility requiring 300 feet of right-of-way.

Traffic Interchanges

Proposed future TIs are located at Selma Avenue, Gila Bend Highway, and Kortsen Road. Future proposed system interchanges are planned at I-8, SR-84, and the proposed Val Vista Expressway. Future expressway crossings are planned at Peters Road, Cottonwood Lane, and McCartney Road.

Access Management

Recommended access management guidelines for this facility are provided in Section 7.3 of the 2007 Casa Grande SATS.

3.9.4 Study Area Roadway Functional Classification

Functional classification is a method used in which streets and highways are grouped into classes, or systems, according to the disposition of service they are intended to provide. Functional classification is necessary to determine how travel can be channeled within the network in a reasonable and efficient manner.

Tables 3.12 through 3.19 define the functional classifications used by study area jurisdictions for arterials and higher-functioning roads (collectors and higher on the state system). Each table includes the following elements, where available: roadway classification, primary function, access control, location/spacing, service function, on-street parking, and right-of-way.

Table 3.12 Maricopa County Functional Classification Definitions

Roadway Classification	Access Control	Location/Spacing	Service Function	Right-of-Way
Principal Arterial	Not specified	Not specified	Traffic movements consisting of through movements and major circulation movements	130' (additional 20' required for rural arterial)
			Traffic movements involving a large portion of the total urban area travel on a minimum of mileage	4-6 lanes, divided with median and exclusive left-turn lanes, where applicable
Minor Arterial	Partially	Not specified	Traffic movements consisting of major circulation movements with more emphasis on land access	130'
			Traffic movements do not penetrate residential neighborhoods	4 lanes, divided with center left-turn lane
			Traffic movements at moderate speeds	
			Traffic movements having a turnaround	

Table 3.13 Pinal County Functional Classification Definitions

Roadway Classification	Posted Speed	Access Control	Left Turn Lanes	Right Turn Lanes	On-Street Parking	Right-of-Way
RSR Parkway	50-65 mph	To be determined by Pinal County in reference to the Final Arizona Parkway Guidelines			Prohibited	200'; 6 lanes
RSR Principal Arterial	35-50 mph	Intersections and signals every ¼ to ½ mile; grade-separated interchanges at one-mile locations where warranted; frontage roads possible; divided w/ full or directional median openings at ¼-mile spacing	Wherever left turns are permitted	Wherever right turns are permitted and volumes warrant	Prohibited	130-150'; 6 lanes

Table 3.14 City of Avondale Functional Classification Definitions

Roadway Classification	Primary Function	Access Control	Location/Spacing	Service Function	On-Street Parking	Right-of-Way
Freeway	Mobility	Full	Not specified	Intended to provide high levels of safety and efficiency in the movement of large volumes of traffic at high speeds	Prohibited	Minimum: 12 Lanes Minimum lane width: 12 Ft.
Road of Regional Significance (RRS)	Mobility	Very High	Two-mile intervals	Intended to support high travel speeds Incorporate channelled intersections Adequate connection to other arterial streets	Restricted	130'-150'
Arterial	Mobility	High	One-Mile intervals	Support high-speed, moderate traffic volumes Carry medium percentage of total urban traffic Serve retail, commercial, and industrial land uses Adequate connections to major collector streets	Not specified	110'

Sources for Tables 3.12 through 3.14: Maricopa County Major Streets and Routes Plan, 2004 (3.12); Pinal County RSRSM Final Report, December 2008 (3.13); Avondale General Plan, June 17, 2002 (3.14)

Table 3.15 Town of Buckeye Functional Classification Definitions

Roadway Classification	Access Control	Location/Spacing	Service Function	Right-of-Way
Freeway	Full	Not specified	Connector between SR-85 and I-10	400'
				4 to 6 lanes, divided
Parkway	Limited	Not specified	Intended to support high travel speeds	200' + 20' Public Utility Easement (PUE)
			Incorporate channelled intersections	4 to 6 lanes
			Adequate connection to other arterial streets	
Fixed Guideway Arterial	Limited	Not specified	Intended to support high travel speeds	190' + 10' PUE
			Incorporate channelled intersections	4 to 6 lanes
			Adequate connection to other arterial streets	
Major Arterial	Limited	One-mile intervals	Permit the flow of high volumes of traffic in controlled condition	140 + 10' PUE
				4 to 6 lanes
			Intersections with rail lines continued, underpasses preferred	Right and left turn Lanes
			Connect with I-10, expressways, and parkways	
Minor Arterial	Limited	One-mile intervals	Permit the flow of high volumes of traffic in controlled condition	110' + 10' PUE
				4 to 6 lanes
			Intersections with rail lines continued, underpasses preferred	Right and left turn lanes
			Connections to major roadways determined on a case-by-case basis	

Table 3.16 City of Casa Grande Functional Classification Definitions

Roadway Classification	Primary Function	Access Control	Location/Spacing	Service Function	On-Street Parking	Right-of-Way
Expressway	Mobility	No access to abutting land nor on-street parking	One-mile intervals	Provides expeditious movement of large volumes of through traffic	Prohibited	300'
				Divided roadway permits complete separation of opposing traffic flow		6 lanes with median
				Does not provide access to abutting land nor on-street parking		
Arterial	Mobility	Controlled through raised medians and spacing and location of driveways and intersections	Quarter-mile intervals and driveways to major developments	Traffic movements with long or moderately long trip lengths	Prohibited	110' to 140'
				Through and major traffic circulation movements		4 to 6 lanes with median
				Traffic movements at moderate speeds		
				Traffic movements do not penetrate residential neighborhoods		
				Traffic movements over relatively short distances, less than one-half mile long in most cases		
				Traffic movements subject to frequent driveway access		2 lanes

Sources for Tables 3.15 and 3.16: Town of Buckeye Roadway Classification Standards Design Manual #200, 2007 (3.15); Casa Grande General Plan 2010 (3.16)

Table 3.17 City of Goodyear Functional Classification Definitions

Roadway Classification	Primary Function	Access Control	Location/Spacing	Service Function	Right-of-Way
Freeway/Expressway	160,000 to 200,000 vehicles per day	Full	Not specified	Designed to move high volumes of traffic over substantial distances	4 to 8 through lanes
Parkway	Up to 85,000 vehicles per day	Not specified	Not specified	Designed to move high volumes of traffic over substantial distances	4 to 6 through lanes
Scenic Arterial	Not specified	Not specified	Not specified	Transport vehicular traffic through the city	150'
				Act as the City Center loop gateway for residents, employees, and visitors	4 to 6 lanes; 2 bike lanes; 2 grade-separated sidewalks; and raised median
City Center Arterial	Not specified	Not specified	Goodyear Boulevard is the only one	Continue the scenic theme of Yuma Road and Estrella Parkway segments within the Goodyear Boulevard loop road	150'
					4 to 6 lanes; 2 grade-separated sidewalks; and raised median
				Development may front a major collector	
Major Arterial	Not specified	Not specified	Not specified	Vehicular mobility over moderate trip lengths	130'
					6 lanes; 2 bike lanes; 2 grade-separated sidewalks; raised median; and landscape tracts
Arterial	Not specified	Not specified	Not specified	Vehicular mobility over moderate trip lengths	110'
					4 lanes; 2 bike lanes; 2 grade-separated sidewalks; raised median; and landscape tracts

Table 3.18 City of Maricopa Functional Classification Definitions

Roadway Classification	Primary Function	Access Control	Location/Spacing (of Intersections)	Service Function	On-Street Parking	Right-of-Way
Expressway	Regional connectivity	Traffic interchanges in ultimate design	1-mile minimum	Highest traffic volumes; connects major activity centers; longest trips	Not allowed	300 minimum 6 lanes
Parkway	Mobility	Public streets and driveways	½-mile minimum; 1-mile desirable	Major traffic flows; connects to regional system; connects major activity centers; pleasure driving	Not allowed	200' 6 to 8 lanes
Principal Arterial I	Mobility	Public streets and driveways	½-mile minimum; 1-mile desirable	Major traffic flows; connects to regional system Serves major centers, neighborhoods and business centers	Not allowed	150' 6 lanes
Principal Arterial II	Mobility	Public streets and driveways	¼-mile minimum; ½-mile desirable	Serves similar circulation needs as Principal Arterial I Could have more access points and provide more local service than Principal Arterial I	Not allowed	150' 6 lanes
Minor Arterial	Mobility	Major driveways only	No restrictions	Connects with and augments Principal Arterials; serves similar circulation needs as PAs; trips of moderate length; provides access to major destinations	Not allowed	110' 4 lanes

Sources for Tables 3.17 and 3.18: Goodyear General Plan, 2003 (3.17); Maricopa RTP Update 2008 (Table 6.1)

Table 3.19 ADOT Functional Classification Definitions

Roadway Classification *(Rural System)*	**Primary Function**	**Service Function**
Principal Arterial	Mobility	Serve the highest volume long-distance trips
Minor Arterial	Not specified	Serve most of the larger communities not served by the principal arterial system
		Provides interstate and intercounty service
		Trip length and travel density are greater than on the collectors
		Travel is a relatively high speed
Major Collector	Not specified	Serves trips of intracounty and regional importance
		Provides service to any county seat not on an arterial
		Serves larger communities not directly served by the higher systems
Minor Collector	Not specified	Collect traffic from local roads and feed it to major collectors or arterials
		Carry traffic on shorter trips or to less important destinations
		Serve traffic movements parallel to routes of a higher classification
Roadway Classification *(Urban System)*	**Primary Function**	**Service Function**
Principal Arterial	Mobility	Provide the greatest mobility for through movement
		Serves the highest volume traffic generators and longer trips
Minor Arterial	Not specified	Serve trips of moderate length and trips of lower travel mobility than urban principal arterials
		Speeds are lower than on urban principal arterials
Collector	Not specified	Distribute traffic from arterials
		Funnel traffic from local streets onto the arterial system

Source: 1998 Status and Condition Of The Arizona Highway System, ADOT Transportation Planning Division

3.9.5 Existing Traffic Volumes

Table 3.20 displays available recent traffic counts on freeways and arterials in the Hidden Valley study area. Data was gathered from ADOT's State Highway System Annual Average Daily Traffic (AADT) Log for 2006, MCDOT 2004 Manual Traffic Counts, the 2006 Pinal County SATS, the 2000 Rainbow Valley Area Plan, and the 2000 SR-85 Corridor Area Plan prepared by the Maricopa County Planning and Development Department (MCPDD). All counts were rounded to the nearest hundred. ADOT figures are "raw" traffic volumes converted to average annual daily traffic volumes using correction and seasonal factors.

Table 3.20 Hidden Valley ADT

Agency	Community	Street	Reference Street	ADT	Year	Source
North-South State Highways--Maricopa County						
ADOT	Gila Bend	SR-85	SB-8 (Gila Bend) to Landfill Entrance Rd.	11,300	2006	ADOT
ADOT	Buckeye	SR-85	Landfill Entrance Rd. to Buckeye Rd.	10,400	2006	ADOT
ADOT	Buckeye	SR-85	Buckeye Rd. to I-10 (Exit 112)	16,500	2006	ADOT
East-West State Highways--Maricopa County						
MCPDD	Gila Bend	SR-238	East of SR-85	900	2004	MCDOT
ADOT	Maricopa	SR-238	SR-347 to Hidden Valley Rd.	5,000	2006	ADOT
ADOT	Maricopa	SR-238	West of Hidden Valley Rd	1,300	2006	ADOT
MCPDD	Buckeye	MC-85	East of SR-85	3,600	2000	SR-85 Corridor Plan
MCPDD	Buckeye	MC-85	East of Watson Rd.	4,000	2000	SR-85 Corridor Plan
MCPDD	Buckeye	MC-85	East of Airport Rd.	6,500	2000	Rainbow Valley Plan
Pinal Co.	Maricopa County	SR-238	West of County Line	2,300	2005	Pinal Co. SATS
North-South State Highways--Pinal County						
Pinal Co.	Maricopa	SR-347	North of SR-84	10,900	2005	Pinal Co. SATS
Pinal Co.	Maricopa	SR-347	At Clayton Rd.	11,100	2005	Pinal Co. SATS
Pinal Co.	Maricopa	SR-347	North of Clayton Rd.	11,000	2005	Pinal Co. SATS
Pinal Co.	Maricopa	SR-347	North of Louis Johnson Dr.	11,300	2005	Pinal Co. SATS
Pinal Co.	Maricopa/Ak-Chin	SR-347	South of Papago Rd.	11,100	2005	Pinal Co. SATS
Pinal Co.	Maricopa/Ak-Chin	SR-347	North of Papago Rd.	11,700	2005	Pinal Co. SATS
Pinal Co.	Maricopa/Ak-Chin	SR-347	South of Farrell Rd.	12,700	2005	Pinal Co. SATS
Pinal Co.	Maricopa/Ak-Chin	SR-347	North of Farrell Rd.	13,000	2005	Pinal Co. SATS
Pinal Co.	Maricopa	SR-347	At Honeycutt Rd.	15,600	2005	Pinal Co. SATS
Pinal Co.	Maricopa	SR-347	South of Maricopa-Casa Grande Hwy.	20,600	2005	Pinal Co. SATS
Pinal Co.	Maricopa	SR-347	North of Maricopa-Casa Grande Hwy.	19,900	2005	Pinal Co. SATS
Pinal Co.	Maricopa	SR-347	North of Smith-Enke Rd.	28,100	2005	Pinal Co. SATS
Pinal Co.	Maricopa	SR-347	North of Casa Blanca Rd.	27,500	2005	Pinal Co. SATS
Pinal Co.	Maricopa	SR-347	South of County Line	27,600	2005	Pinal Co. SATS
Pinal Co.	GRIC	SR-587	North of St. Peters Mission/Nelson Rd.	10,800	2005	Pinal Co. SATS

Table 3.20 Continued

Agency	Community	Street	Reference Street	ADT	Year	Source
North-South State Highways--Pinal County						
Pinal Co.	GRIC	SR-587	South of SR-87	9,800	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	SR-387	North of Junction SR-84/SR-287	20,300	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	SR-387	North of SR-238	26,600	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	SR-387	North of Rodeo Rd.	22,000	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	SR-387	North of McCartney Rd.	21,900	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	SR-387	South of Val Vista Blvd.	22,600	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	SR-387	North of Val Vista Blvd.	14,500	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	SR-387	South of GRIC	13,800	2005	Pinal Co. SATS
ADOT	Casa Grande	SR-387	SR-84/SR-287 to Cottonwood Ln.	18,400	2006	ADOT
ADOT	Casa Grande	SR-387	Cottonwood Ln. to Kortsen Rd.	23,500	2006	ADOT
ADOT	Casa Grande	SR-387	Kortsen Rd. to Rodeo Rd.	21,100	2006	ADOT
ADOT	Casa Grande	SR-387	Rodeo Rd. to Hopi Dr.	21,000	2006	ADOT
ADOT	Casa Grande	SR-387	Hopi Dr. to I-10 (Exit 185)	15,500	2006	ADOT
ADOT	GRIC	SR-387	I-10 (Exit 185) to SR-187	15,600	2006	ADOT
ADOT	GRIC	SR-387	SR-187 to SR-87	2,800	2006	ADOT
Pinal Co.	GRIC	SR-187	North of I-10	2,400	2005	Pinal Co. SATS
Pinal Co.	GRIC	SR-187	South of BIA-7	6,400	2005	Pinal Co. SATS
Pinal Co.	GRIC	SR-187	South of SR-87	3,600	2005	Pinal Co. SATS
Pinal Co.	GRIC	SR-87	North of SR-387	7,600	2005	Pinal Co. SATS
Pinal Co.	GRIC	SR-87	South of SR-187	6,600	2005	Pinal Co. SATS
Pinal Co.	GRIC	SR-87	North of SR-187	5,200	2005	Pinal Co. SATS
Pinal Co.	GRIC	SR-87	South of River Rd.	3,700	2005	Pinal Co. SATS
Pinal Co.	GRIC	SR-87	North of River Rd.	3,500	2005	Pinal Co. SATS
Pinal Co.	GRIC	SR-87	North of BIA-7	4,200	2005	Pinal Co. SATS
Pinal Co.	GRIC	SR-87	South of BIA-68	4,400	2005	Pinal Co. SATS
Pinal Co.	Eloy	Northbound I-10	North of Toltec Rd.	24,600	2005	Pinal Co. SATS
Pinal Co.	Eloy	Southbound I-10	North of Toltec Rd.	25,500	2005	Pinal Co. SATS
Pinal Co.	Eloy	Northbound I-10	North of Sunland Gin Rd.	23,400	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Northbound I-10	North of Junction I-8	28,600	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Northbound I-10	South of SR-287	25,800	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Southbound I-10	South of SR-287	26,300	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Northbound I-10	North of Cottonwood Ln.	27,200	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Southbound I-10	North of Cottonwood Ln.	28,200	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Northbound I-10	North of McCartney Rd.	23,300	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Northbound I-10	South of GRIC/North of Val Vista Rd.	25,900	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Southbound I-10	South of GRIC/North of Val Vista Rd.	26,300	2005	Pinal Co. SATS
Pinal Co.	GRIC	Northbound I-10	MP 180	25,300	2005	Pinal Co. SATS
Pinal Co.	GRIC	Southbound I-10	MP 180	25,400	2005	Pinal Co. SATS
Pinal Co.	GRIC	Northbound I-10	North of SR-587	21,100	2005	Pinal Co. SATS

Table 3.20 Continued

Agency	Community	Street	Reference Street	ADT	Year	Source
North-South State Highways--Pinal County						
Pinal Co.	GRIC	Southbound I-10	South of SR-587	20,500	2005	Pinal Co. SATS
Pinal Co.	GRIC	Northbound I-10	MP 172	27,400	2005	Pinal Co. SATS
Pinal Co.	GRIC	Southbound I-10	MP 172	27,400	2005	Pinal Co. SATS
Pinal Co.	Chandler	Northbound I-10	South of Riggs Rd.	54,800	2005	Pinal Co. SATS
ADOT	Eloy	Eastbound I-10	Sunshine Blvd. (Exit 200) to Sunland Gin Rd. (Exit 208)	43,100	2006	ADOT
ADOT	Eloy	Eastbound I-10	Sunland Gin Rd. (Exit 199) to I-8 (Exit 200)	43,200	2006	ADOT
ADOT	Casa Grande	Eastbound I-10	I-8 (Exit 198) to Old SR-84 (Exit 199)	42,800	2006	ADOT
ADOT	Casa Grande	Eastbound I-10	Old SR-84 (Exit 194) to SR-287 (Exit 198)	44,600	2006	ADOT
ADOT	Casa Grande	Eastbound I-10	SR-287 (Exit 190) to McCartney Rd. (Exit 194)	49,200	2006	ADOT
ADOT	Casa Grande	Eastbound I-10	McCartney Rd. (Exit 185) to SR-387 (Exit 190)	40, 400	2006	ADOT
ADOT	GRIC	Eastbound I-10	SR-387 (Exit 175) to SR-587 (Exit 185)	58,100	2006	ADOT
ADOT	GRIC	Eastbound I-10	SR-587 (Exit 167) to Riggs Rd. (Exit 175)	54,800	2006	ADOT
East-West State Highways--Pinal County						
ADOT	Gila Bend	Eastbound I-8	Exist 78 Avenue 75E, Spot Road to SB-8 (Exit 115)	11,100	2006	ADOT
ADOT	Gila Bend	Eastbound I-8	SB-8 (Exit 115) to SR-85 (Exit 116)	4,200	2006	ADOT
ADOT	Gila Bend	Eastbound I-8	SR-85 (Exit 116) to SB-8 (Exit 119)	4,500	2006	ADOT
ADOT	Gila Bend	Eastbound I-8	SB-8 (Exit 119) to Vekol Valley Rd. (Exit 144)	7,100	2006	ADOT
ADOT	Maricopa Co.	Eastbound I-8	Vekol Valley Rd. (Exit 144) to SR-84 (Exit 151)	7,100	2006	ADOT
Pinal Co.	Maricopa Co.	Eastbound I-8	MP 155	7,400	2005	Pinal Co. SATS
Pinal Co.	Maricopa Co.	Westbound I-8	MP 155	7,400	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Eastbound I-8	West of Montgomery Rd.	10,800	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Westbound I-8	West of Montgomery Rd.	10,900	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Eastbound I-8	East of Montgomery Rd.	14,100	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Westbound I-8	East of Montgomery Rd.	14,200	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Westbound I-8	At Thornton Rd.	13,000	2005	Pinal Co. SATS
Pinal Co.	Casa Grande/Eloy	Eastbound I-8	West of Junction I-10	17,000	2005	Pinal Co. SATS
Pinal Co.	Casa Grande/Eloy	Westbound I-8	West of Junction I-10	17,700	2005	Pinal Co. SATS
Pinal Co.	Maricopa	SR-84	West of Amarillo Valley Rd.	8,000	2005	Pinal Co. SATS
Pinal Co.	Maricopa	SR-84	West of SR-347	7,200	2005	Pinal Co. SATS
Pinal Co.	Maricopa	SR-84	East of SR-347	4,200	2005	Pinal Co. SATS
Pinal Co.	Maricopa	SR-84	East of White and Parker Rd.	7,300	2005	Pinal Co. SATS
Pinal Co.	Maricopa	SR-84	West of Stanfield Rd.	7,400	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	SR-84	East of Stanfield Rd.	4,700	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	SR-84	East of Anderson Rd.	3,600	2005	Pinal Co. SATS
Pinal Co.	Maricopa	SR-84	Anderson Rd. to Montgomery Rd.	3,700	2005	Pinal Co. SATS

Table 3.20 Continued

Agency	Community	Street	Reference Street	ADT	Year	Source
East-West State Highways--Pinal County						
Pinal Co.	Casa Grande	SR-84	West of Montgomery Rd.	3,700	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	SR-84	East of Montgomery Rd.	6,800	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	SR-84	At Ethington Rd.	7,600	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	SR-84	West of Thornton Rd.	7,900	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	SR-84	East of Junction SR-387	18,100	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	SR-84	West of Peart Rd.	26,700	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	SR-84	East of Peart Rd.	32,700	2005	Pinal Co. SATS
Pinal Co.	Maricopa	SR-84	Peart Rd. to I-10	23,800	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	SR-84	West of I-10	23,800	2005	Pinal Co. SATS
Pinal Co.	Maricopa	SR-84	I-10 to Overfield Rd.	11,900	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	SR-84	East of Overfield Rd.	14,600	2005	Pinal Co. SATS
ADOT	Casa Grande	SR-287	SR-84/SR-387 to Florence St.	17,300	2006	ADOT
ADOT	Casa Grande	SR-287	Florence St. to Trekell Ave.	23,800	2006	ADOT
ADOT	Casa Grande	SR-287	Trekell Ave. to Peart Rd.	27,600	2006	ADOT
ADOT	Casa Grande	SR-287	Peart Rd. to Arizola Rd.	27,800	2006	ADOT
ADOT	Casa Grande	SR-287	Arizola Rd. to I-10 (Exit 194)	19,500	2006	ADOT
ADOT	Casa Grande	SR-287	I-10 (Exit 194) to Overfield Rd./Central Rd.	9,300	2006	ADOT
ADOT	Casa Grande/Eloy	SR-287	Overfield Rd./Central Rd. to 11 Mile Corner Rd.	5,600	2006	ADOT
ADOT	Casa Grande/Eloy	SR-287	11 Mile Corner Rd. to SR-87	3,100	2006	ADOT
ADOT	Coolidge	SR-287	SR-87 to Attaway Rd.	12,400	2006	ADOT
ADOT	Coolidge	SR-287	Attaway Rd. to SR-79B–Florence	8,300	2006	ADOT
Pinal Co.	Casa Grande	SR-238	West of Thornton Rd.	19,000	2005	Pinal Co. SATS
Pinal Co.	GRIC	SR-387	East of I-10	4,000	2005	Pinal Co. SATS
Pinal Co.	Maricopa	SR-238	West of SR-347	7,862	2006	Pinal Co. SATS
Pinal Co.	Maricopa	SR-238	East of SR-347	4,400	2005	Pinal Co. SATS
Pinal Co.	Maricopa	SR-238	East of SR-347	14,390	2006	Pinal Co. SATS
Pinal Co.	Maricopa	SR-238	West of White and Parker Rd.	500	2005	Pinal Co. SATS
Other North-South Roadways--Maricopa County						
MCPDD	Buckeye	Johnson Rd.	North of Broadway Rd.	300	2000	SR-85 Corridor Plan
MCPDD	Buckeye	Bruner Rd.	South of Old US-80	100	2000	SR-85 Corridor Plan
MCPDD	Buckeye	Bruner Rd.	North of Southern Ave.	<50	2000	SR-85 Corridor Plan
MCPDD	Buckeye	Palo Verde Rd.	North of Old US-80	1,300	2000	SR-85 Corridor Plan
MCPDD	Buckeye	Palo Verde Rd.	South of Baseline Rd.	700	2000	SR-85 Corridor Plan
MCPDD	Buckeye	Palo Verde Rd.	North of Baseline Rd.	600	2000	SR-85 Corridor Plan
MCPDD	Buckeye	Palo Verde Rd.	At Lower Buckeye Rd.	800	2000	SR-85 Corridor Plan

Table 3.20 Continued

Agency	Community	Street	Reference Street	ADT	Year	Source
Other North-South Roadways--Maricopa County						
MCPDD	Buckeye	Turner Rd.	North of Baseline Rd.	100	2000	SR-85 Corridor Plan
MCPDD	Buckeye	Miller Rd.	South of MC-85	1,800	2000	SR-85 Corridor Plan
MCPDD	Buckeye	Miller Rd.	South of Baseline Rd.	5,000	2000	SR-85 Corridor Plan
MCPDD	Buckeye	Miller Rd.	North of Broadway Rd.	5,400	2000	SR-85 Corridor Plan
MCPDD	Buckeye	Apache Rd.	North of Baseline Rd.	2,300	2000	SR-85 Corridor Plan
MCPDD	Buckeye	Apache Rd.	North of Southern Ave.	1,300	2000	SR-85 Corridor Plan
MCPDD	Buckeye	Rainbow Rd.	North of Beloat Rd.	200	2000	Rainbow Valley Plan
MCPDD	Buckeye	Rainbow Rd.	South of Southern Ave.	1,100	2000	Rainbow Valley Plan
MCPDD	Buckeye	Dean Rd.	South of MC-85	300	2000	Rainbow Valley Plan
MCPDD	Buckeye	Dean Rd.	North of MC-85	300	2000	Rainbow Valley Plan
MCDOT	Buckeye	Airport Rd.	North of Narramore Rd.	500	2004	MCDOT
MCDOT	Buckeye	Airport Rd.	North of Elliot Rd.	100	2004	MCDOT
MCPDD	Buckeye	Airport Rd.	North of Beloat Rd.	300	2000	Rainbow Valley Plan
MCPDD	Buckeye	Airport Rd.	North of MC-85	400	2000	Rainbow Valley Plan
MCPDD	Buckeye	Tuthill Rd.	South of Ray Rd.	200	2000	Rainbow Valley Plan
MCDOT	Buckeye	Tuthill Rd.	North of Narramore Rd.	3,700	2004	MCDOT
MCPDD	Buckeye	Tuthill Rd./Jackrabbit Trail	South of Beloat Rd.	4,500	2000	Rainbow Valley Plan
MCPDD	Buckeye	Tuthill Rd.	North of Beloat Rd.	100	2000	Rainbow Valley Plan
MCPDD	Buckeye	Jackrabbit Trail	South of MC-85	3,200	2000	Rainbow Valley Plan
MCPDD	Buckeye	Jackrabbit Trail	North of MC-85	2,200	2000	Rainbow Valley Plan
MCPDD	Buckeye	Rainbow Valley Rd.	North of Narramore Rd.	1,500	2000	Rainbow Valley Plan
MCPDD	Buckeye	Perryville Rd.	North of MC-85	200	2000	Rainbow Valley Plan
MCDOT	GRIC	51st Ave.	North of Pecos Rd.	7,800	2004	MCDOT
MCDOT	GRIC	51st Ave.	South of St. Johns Rd.	7,800	2004	MCDOT
MCPDD	Gila Bend	Old US-80	North of Watermelon Rd.	500	2000	SR-85 Corridor Plan
MCDOT	Buckeye	Old US-80	South of Patterson Rd.	400	2004	MCDOT (Traffic Counts)
MCDOT	Buckeye	Old US-80	North of Patterson Rd.	400	2004	MCDOT
MCDOT	Buckeye	Old US-80	South of Agua Caliente Rd.	400	2004	MCDOT
MCDOT	Buckeye	Old US-80	North of Agua Caliente Rd.	500	2004	MCDOT
MCDOT	Buckeye	Old US-80	North of Desert Rose Rd.	300	2004	MCDOT
MCDOT	Buckeye	Old US-80	East of Arlington School Rd.	1,000	2004	MCDOT

Table 3.20 Continued

Agency	Community	Street	Reference Street	ADT	Year	Source
Other East-West Roadways--Maricopa County						
MCPDD	Gila Bend	Watermelon Rd.	East of Citrus Valley Rd.	200	2004	MCDOT
MCPDD	Gila Bend	Watermelon Rd.	East of 315th Ave./Gila Blvd.	200	2004	MCDOT
MCPDD	Gila Bend	Pierpoint Rd.	West of Old US-80	100	2000	SR-85 Corridor Plan
MCPDD	Gila Bend	Woods Rd.	West of SR-85	200	2000	SR-85 Corridor Plan
MCDOT	Buckeye	Ray Rd.	East of Tuthill Rd.	300	2004	MCDOT
MCPDD	Buckeye	Ray Rd.	West of Rainbow Valley Rd.	400	2000	Rainbow Valley Plan
MCPDD	Buckeye	Arlington Rd.	East of Airport Rd.	300	1999	Rainbow Valley Plan
MCDOT	Buckeye	Elliot Rd.	West of 355th Ave.	300	2004	MCDOT
MCPDD	Buckeye	Elliot Rd.	East of Airport Rd.	800	2000	Rainbow Valley Plan
MCPDD	Buckeye	Elliot Rd.	East of Airport Rd.	800	2000	Rainbow Valley Plan
MCPDD	Buckeye	Elliot Rd.	East of Tuthill Rd.	1,600	2000	Rainbow Valley Plan
MCPDD	Buckeye	Hazen Rd.	East of SR-85	700	2000	SR-85 Corridor Plan
MCPDD	Buckeye	Beloat Rd.	East of Johnson Rd.	100	2000	SR-85 Corridor Plan
MCPDD	Buckeye	Beloat Rd.	East of Rooks Rd.	100	2000	SR-85 Corridor Plan
MCPDD	Buckeye	Beloat Rd.	East of Rainbow Rd.	1,900	2004	MCDOT
MCDOT	Buckeye	Beloat Rd.	East of Airport Rd.	2,100	2004	MCDOT
MCDOT	Buckeye	Beloat Rd.	East of Tuthill Rd.	2,200	2004	MCDOT
MCPDD	Buckeye	Baseline Rd.	West of Bruner Rd.	1,700	2000	SR-85 Corridor Plan
MCPDD	Buckeye	Baseline Rd.	East of Palo Verde Rd.	2,200	2000	SR-85 Corridor Plan
MCPDD	Buckeye	Baseline Rd.	East of SR-85	2,600	2000	SR-85 Corridor Plan
MCPDD	Buckeye	Baseline Rd.	West of Central Blvd.	3,200	2000	SR-85 Corridor Plan
MCPDD	Buckeye	Southern Ave.	West of Bruner Rd.	300	2000	SR-85 Corridor Plan
MCPDD	Buckeye	Southern Ave.	East of Wilson Ave.	600	2000	SR-85 Corridor Plan
MCPDD	Buckeye	Southern Ave.	At Rooks Rd.	700	2000	SR-85 Corridor Plan
MCPDD	Buckeye	Southern Ave.	East of Watson Rd.	500	2000	SR-85 Corridor Plan
MCPDD	Buckeye	Southern Ave.	East of Jackrabbit Trail	200	2000	Rainbow Valley Plan
MCPDD	Buckeye	Broadway Rd.	West of Bruner Rd.	<50	2000	SR-85 Corridor Plan
MCPDD	Buckeye	Broadway Rd.	East of Oglesby Rd.	500	2000	SR-85 Corridor Plan
MCPDD	Buckeye	Broadway Rd.	At Rooks Rd.	1,100	2000	SR-85 Corridor Plan
MCPDD	Buckeye	Broadway Rd.	At Watson Rd.	1,400	2000	SR-85 Corridor Plan
MCDOT	GRIC	Estrella Dr.	East of 67th Ave.	600	2004	MCDOT
MCDOT	GRIC	Estrella Dr.	East of 51st Ave.	700	2004	MCDOT
MCPDD	Buckeye	Old US-80	West of SR-85	900	2000	SR-85 Corridor Plan

Table 3.20 Continued

Agency	Community	Street	Reference Street	ADT	Year	Source
Other North-South Roadways--Pinal County						
Pinal Co.	Maricopa	Hidden Valley Rd.	North of Papago Rd.	2,500	2005	Pinal Co. SATS
Pinal Co.	Maricopa	Hidden Valley Rd.	South of SR-238	3,100	2005	Pinal Co. SATS
Pinal Co.	Maricopa	Warren Rd.	North of SR-84	2,800	2005	Pinal Co. SATS
Pinal Co.	Maricopa	Warren Rd.	South of Century Rd.	2,700	2005	Pinal Co. SATS
Pinal Co.	Maricopa	Warren Rd.	North of Century Rd.	3,600	2005	Pinal Co. SATS
Pinal Co.	Maricopa	Warren Rd.	At Miller Rd.	3,700	2005	Pinal Co. SATS
Pinal Co.	Maricopa	Warren Rd.	South of Papago Rd.	3,000	2005	Pinal Co. SATS
Pinal Co.	Maricopa	Ralston Rd.	North of Papago Rd.	1,000	2005	Pinal Co. SATS
Pinal Co.	Maricopa/Ak-Chin	Ralston Rd.	South of Farrell Rd.	500	2005	Pinal Co. SATS
Pinal Co.	Maricopa/Ak-Chin	Ralston Rd.	North of Farrell Rd.	1,500	2005	Pinal Co. SATS
Pinal Co.	Maricopa/Ak-Chin	Ralston Rd.	South of SR-238	800	2005	Pinal Co. SATS
Pinal Co.	Maricopa	White and Parker Rd.	North of SR-84	3,800	2005	Pinal Co. SATS
Pinal Co.	Ak-Chin	White and Parker Rd.	North of Louis Johnson Dr.	4,200	2005	Pinal Co. SATS
Pinal Co.	Maricopa	White and Parker Rd.	South of Maricopa-Casa Grande Hwy.	4,000	2005	Pinal Co. SATS
Pinal Co.	Maricopa	White and Parker Rd.	North of Maricopa-Casa Grande Hwy.	5,300	2005	Pinal Co. SATS
Pinal Co.	Maricopa-Casa Grande	Stanfield Rd.	South of I-8	1,700	2005	Pinal Co. SATS
Pinal Co.	Maricopa-Casa Grande	Stanfield Rd.	At I-8	4,300	2005	Pinal Co. SATS
Pinal Co.	Maricopa-Casa Grande	Stanfield Rd.	North of I-8	7,100	2005	Pinal Co. SATS
Pinal Co.	Maricopa-Casa Grande	Stanfield Rd.	South of SR-84	6,500	2005	Pinal Co. SATS
Pinal Co.	GRIC	Murphy Rd.	South of Casa Blanca Rd.	4,900	2005	Pinal Co. SATS
Pinal Co.	Maricopa	Anderson Rd.	North of SR-84	3,200	2005	Pinal Co. SATS
Pinal Co.	Maricopa-Casa Grande	Anderson Rd.	South of Maricopa-Casa Grande Hwy.	3,000	2005	Pinal Co. SATS
Pinal Co.	Maricopa	Montgomery Rd.	South of SR-84	6,900	2005	Pinal Co. SATS
Pinal Co.	Maricopa	Montgomery Rd.	South of Maricopa-Casa Grande Hwy.	5,400	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Burris Rd.	North of Maricopa-Casa Grande Hwy.	9,300	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Burris Rd.	North of Rodeo Rd.	4,700	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Burris Rd.	South of Val Vista Blvd.	4,500	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Thornton Rd.	North of I-8	10,500	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Thornton Rd.	South of SR-84	10,200	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Thornton Rd.	North of SR-84	12,700	2005	Pinal Co. SATS
Pinal Co.	Eloy	Chuichu Rd.	North of Houser Rd.	5,200	2005	Pinal Co. SATS
Pinal Co.	Maricopa	Chuichu Rd.	North of I-8	6,500	2005	Pinal Co. SATS
Pinal Co.	Maricopa	Peart Rd.	North of SR-287	6,900	2005	Pinal Co. SATS
Pinal Co.	Maricopa	Peart Rd.	North of Cottonwood Ln.	6,000	2005	Pinal Co. SATS
Pinal Co.	Maricopa	Peart Rd.	South of McCartney Rd.	7,400	2005	Pinal Co. SATS
Pinal Co.	Eloy	Sunland Gin Rd.	South of Phillips Rd.	2,700	2005	Pinal Co. SATS
Pinal Co.	Eloy/Arizona City	Sunland Gin Rd.	South of Battaglia Dr.	6,800	2005	Pinal Co. SATS

Table 3.20 Continued

Agency	Community	Street	Reference Street	ADT	Year	Source
Other North-South Roadways--Pinal County						
Pinal Co.	Eloy	Sunland Gin Rd.	North of Houser Rd.	8,100	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Cox Rd.	South of Val Vista Blvd.	2,800	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Overfield Rd.	South of SR-287	5,900	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Overfield Rd.	North of SR-287	5,100	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Overfield Rd.	South of McCartney Rd.	4,700	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Overfield Rd.	North of McCartney Rd.	7,700	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Signal Peak Rd.	South of SR-287	6,000	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Maricopa-Casa Grande Hwy.	North of Ethington Rd.	11,200	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Maricopa-Casa Grande Hwy.	South of Montgomery Rd.	10,700	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Maricopa-Casa Grande Hwy.	North of Montgomery Rd.	9,000	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Maricopa-Casa Grande Hwy.	North of Midway/Papoose Rd.	8,700	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Maricopa-Casa Grande Hwy.	South of Russell Rd.	8,500	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Maricopa-Casa Grande Hwy.	South of Anderson Rd.	9,900	2005	Pinal Co. SATS
Pinal Co.	Maricopa	Maricopa-Casa Grande Hwy.	North of Anderson Rd.	9,400	2005	Pinal Co. SATS
Pinal Co.	Maricopa	Maricopa-Casa Grande Hwy.	North of Murphy Rd.	10,900	2005	Pinal Co. SATS
Pinal Co.	Maricopa	Maricopa-Casa Grande Hwy.	South of White and Parker Rd.	10,200	2005	Pinal Co. SATS
Pinal Co.	Maricopa	Maricopa-Casa Grande Hwy.	North of White and Parker Rd.	7,700	2005	Pinal Co. SATS
Pinal Co.	Maricopa	Maricopa-Casa Grande Hwy.	South of SR-347	7,600	2005	Pinal Co. SATS
Pinal Co.	GRIC	BIA-7	North of SR-187	3,400	2005	Pinal Co. SATS
Pinal Co.	GRIC	BIA-7	South of BIA-1	3,000	2005	Pinal Co. SATS
Pinal Co.	GRIC	BIA-7	North of BIA-1	1,000	2005	Pinal Co. SATS
Pinal Co.	GRIC	BIA-1	North of SR-87	2,800	2005	Pinal Co. SATS
Pinal Co.	GRIC	BIA-1	East of BIA-7	2,900	2005	Pinal Co. SATS
Pinal Co.	GRIC	BIA-1	West of BIA-7	2,200	2005	Pinal Co. SATS
Pinal Co.	GRIC	BIA-1	West of BIA-7	5,700	2005	Pinal Co. SATS
Pinal Co.	GRIC	BIA-1	East of Terrace Rd.	4,100	2005	Pinal Co. SATS
Pinal Co.	Tohono-O'odham	BIA-15	North of BIA-42	1,400	2005	Pinal Co. SATS
Pinal Co.	Tohono-O'odham	BIA-15	South of St. Augustine St.	4,800	2005	Pinal Co. SATS
Pinal Co.	Eloy	Old SR-84	South of Toltec Rd.	6,700	2005	Pinal Co. SATS
Pinal Co.	Eloy	Old SR-84	South of Toltec Rd.	7,300	2005	Pinal Co. SATS
Pinal Co.	Eloy	Old SR-84	South of Sunland Gin Rd.	7,800	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Old SR-84	North of Sunland Gin Rd.	9,500	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Old SR-84	South of Selma Hwy.	19,100	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Old SR-84	South of Selma Hwy.	24,600	2005	Pinal Co. SATS

Table 3.20 Continued

Agency	Community	Street	Reference Street	ADT	Year	Source
Other East-West Roadways—Pinal County						
Pinal Co.	Eloy/Pinal Co.	Green Reservoir Rd.	At Toltec Hwy.	3,300	2005	Pinal Co. SATS
Pinal Co.	Eloy	Battaglia Dr.	East of Chuichu Rd.	5,300	2005	Pinal Co. SATS
Pinal Co.	Eloy/Arizona City	Battaglia Dr.	West of Sunland Gin Rd.	7,000	2005	Pinal Co. SATS
Pinal Co.	Eloy	Battaglia Dr.	East of Sunland Gin Rd.	6,200	2005	Pinal Co. SATS
Pinal Co.	Eloy	Battaglia Dr.	East of Toltec Rd.	5,300	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Selma Hwy.	East of I-10	9,300	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Selma Hwy.	At Overfield Rd.	8,900	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Selma Hwy.	West of Signal Peak Rd.	9,100	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Selma Hwy.	East of Signal Peak Rd.	6,100	2005	Pinal Co. SATS
Pinal Co.	Maricopa	Century Rd.	East of Warren Rd.	1,700	2005	Pinal Co. SATS
Pinal Co.	Maricopa	Century Rd.	West of SR-347	800	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Cottonwood Ln.	East of SR-347	14,900	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Cottonwood Ln.	West of Peart Rd.	13,100	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Cottonwood Ln.	East of Peart Rd.	8,700	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Cottonwood Ln.	West of I-10	8,400	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Cottonwood Ln.	West of Overfield Rd.	8,200	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	McCartney Rd.	East of SR-347	3,900	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	McCartney Rd.	East of Peart Rd.	7,700	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	McCartney Rd.	East of I-10	6,900	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	McCartney Rd.	West of Overfield Rd.	6,700	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Woodruff Rd.	East of Cox Rd.	3,000	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Woodruff Rd.	West of Overfield Rd.	3,200	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Woodruff Rd.	East of Overfield Rd.	6,600	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Val Vista Blvd.	West of Midway/Papoose Rd.	6,600	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Val Vista Blvd.	East of Burris Rd.	2,700	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Val Vista Blvd.	West of SR-347	18,500	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Val Vista Blvd.	East of SR-347	8,600	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Val Vista Blvd.	East of I-10	8,800	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Val Vista Blvd.	West of Cox Rd.	8,400	2005	Pinal Co. SATS
Pinal Co.	GRIC	Val Vista Blvd.	West of Overfield Rd.	8,100	2005	Pinal Co. SATS
Pinal Co.	Maricopa	Papago Rd.	East of Warren Rd.	1,100	2005	Pinal Co. SATS
Pinal Co.	Maricopa	Papago Rd.	West of Amarillo Valley Rd.	600	2005	Pinal Co. SATS
Pinal Co.	Maricopa	Papago Rd.	West of SR-347	2,000	2005	Pinal Co. SATS
Pinal Co.	Ak-Chin	Farrell Rd./BIA-14	East of Ralston Rd.	1,000	2005	Pinal Co. SATS
Pinal Co.	Ak-Chin	Farrell Rd./BIA-14	West of SR-347	2,900	2005	Pinal Co. SATS
Pinal Co.	GRIC	St. Peters Mission/Nelson Rd.	West of Murphy Rd.	3,800	2005	Pinal Co. SATS
Pinal Co.	GRIC	St. Peters Mission/Nelson Rd.	East of BIA-107	3,100	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Selma Hwy.	East of I-10	9,300	2005	Pinal Co. SATS

Table 3.20 Continued

Agency	Community	Street	Reference Street	ADT	Year	Source
			Other East-West Roadways—Pinal County			
Pinal Co.	Casa Grande	Selma Hwy.	At Overfield Rd.	8,900	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Selma Hwy.	West of Signal Peak Rd.	9,100	2005	Pinal Co. SATS
Pinal Co.	Casa Grande	Selma Hwy.	East of Signal Peak Rd.	6,100	2005	Pinal Co. SATS
Pinal Co.	GRIC	BIA-1	West of BIA-85	3,700	2005	Pinal Co. SATS
Pinal Co.	GRIC	BIA-1	East of BIA-85	3,700	2005	Pinal Co. SATS
Pinal Co.	GRIC	BIA-1	East of Murphy Rd.	4,200	2005	Pinal Co. SATS
Pinal Co.	GRIC	BIA-1	East of BIA-107	4,600	2005	Pinal Co. SATS

3.9.6 Existing Highway Bridges

Bridges over rivers and major washes include the following:

- Gila River: I-10, SR-85, SR-347, SR-87, SR-587, Old US-80
- Santa Cruz Wash: Honeycutt Rd., SR-347
- Santa Rosa Wash: SR-84, White and Parker Rd., Maricopa-Casa Grande Hwy., Honeycutt Rd., Smith Enke Rd., SR-347
- Vekol Wash: SR-238, I-8
- Waterman Wash: SR-238

Canal Crossings

Arlington/Enterprise Canal – This canal generally follows the north side of the Gila River from Buckeye to W. Desert Rose Road. At that point, the canal crosses over to the west side of Old US-80 and becomes the Enterprise Canal. The canal ends at the Gillespie Dam at the Gila River, approximately 4.5 miles farther south. The following canal crossings are associated with major existing roadways in the study area:

- Old US-80, 160 yards north of W. Desert Rose Road
- Old US-80, 95 yards north of W. Agua Caliente Road

Gila Bend Canal – The Gila Bend Canal continues from Gillespie Dam south on the east side of the Gila River and generally parallels Old US-80 from the Gila River to Gila Bend. The following canal crossings are associated with major existing roadways in the study area:

- W. Patterson Rd. directly east of Old US-80
- W. Woods Rd. 130 yards east of Old US-80
- SR-85, 40 yards east of Old US-80
- S. Martin Ave. in Gila Bend
- I-8, at MP 115, 590 yards east of the SR-85 overpass
- SR-85, 425 yards south of its overpass of I-8
- I-8, approximately 5.6 miles west of MP 115
- I-8, approximately 8.2 miles west of MP 106 and 1,000 yards east of S. Paloma Rd.
- I-8, approximately 350 yards east of Painted Rock Dam Rd. at MP 102

3.9.7 Proposed Highway Bridges

The MAG Southwest Area Transportation Study Final Report--Executive Summary identifies a number of major arterial roadways that are proposed for development in the Hidden Valley study area. Some of these arterials would require river crossings. Information about these crossings has been extracted from the Executive Summary and is provided in Table 3.21.

Table 3.21 Proposed Bridge Improvements, Southwest Maricopa County

Road	River	Current Lanes	Future Lanes	Added Lanes	Current Conditions	Action	Cost (Millions)
115th Ave.	Gila	4	4	0	Bridge: not deficient	None	$0
El Mirage Rd.	Gila	4	4	0	Low-lying road	Build bridge	46.8
Bullard Ave.	Gila	2	4	2	Bridge: not deficient	Widen	7.3
Estrella Pkwy.	Gila	2	4	2	Bridge: not deficient	Widen	11.5
Rainbow Valley Rd.	Gila	0	4	0	No crossing	Build bridge	24.0
Tuthill Rd.	Gila	2	4	2	Bridge: not deficient	Widen	8.3
Airport Rd.	Gila	2	4	2	Low-lying road	Build bridge	18.7
Old US 80	Gila	2	4	2	Bridge: deficient	Build bridge	15.6
Old US 80	Hassayampa	2	4	2	Bridge: not deficient	None	0
Total Cost							**$132.2**

Source: Southwest Area Transportation Study, Final Report—Executive Summary, September 2003

3.9.8 Public Railroad Crossings

UPRR Underpasses/Overpasses

Underpasses
- I-10
- I-8

Overpass
- SR-85

UPRR At-Grade Crossings

- Gila Bend: S. Martin Ave.
- Maricopa: S. 83rd Ave., N. Rio Bravo Rd., N. Ralston Rd., SR-347, N. Porter Rd., N. White and Parker Rd.., N. Hartman Rd., N. Anderson Rd.
- Casa Grande: N. Montgomery Rd., N. Ethington Rd., N. Thronton Rd.
- Casa Grande: N. Sacaton St., N. Florence St., N. Hermosilla St., S. Trekell Rd., S. Peart St., S. Sunland Gin Rd.
- Gila River Indian Community: S. Gilbert Rd. (crossing of Chandler Branch)

Several private grade crossings of the UPRR mainline (Sunset Corridor) also exist in the study area.

3.9.9 Programmed Short-Term Roadway Improvements

Table 3.22 provides a list of programmed and (with few exceptions) funded short-term roadway improvements adopted by the many jurisdictions in the Hidden Valley study area.

3.9.10 Planned Short- and Long-Range Roadway Improvements

Table 3.23 provides a list of planned roadway improvements identified by jurisdictions in the Hidden Valley study area.

Table 3.22
Programmed Short-Term Roadway Improvements

Project	Location	Work	Program Year	Total Cost
Maricopa County				
SR-85	I-8 to I-10	Design, R/W, and utilities (34 miles)	FY 2007-09	$31.400,000
	MP 120.54-MP 122.99	Design, R/W, and utilities (2 miles)	FY 2009	$1,200,000
		Construct roadway (2 miles)		$9,100,000
	SR-85 Improvements	Widen roadway, adding 2 through lanes (34 miles)	FY 2010	$40,000,000
	MP 130.71-MP 137.00	Roadway construction (utilities included) (6 miles)	FY 2008	$20,900,000
	MP 139.01-MP 141.71	Utilities	FY 2007	$1,100,000
		Construct roadway		$17,300,000
	MP 149.40-MP 152.01	Reconstruct and widen	FY 2009	$16,200,000
SR-347 TI	SR-347/I-10 Junction	Traffic interchange improvement	FY 2008	$300,000
Interstate 10	SR-202 to Junction I-8	Design Concept Report	FY 2007	$2,000,000
Cotton Ln.	Elliot Rd. to MC 85	Construct new road and bridge over the Gila River	FY 2007	$50,700,000
Old US-80 Bridge	Gila River	Rehabilitate bridge over Gila River	FY 2007-09	$7,400,000
Chandler Heights Rd.	Sonoqui Wash	Construct 5-lane bridge	FY 2008	$2,310,000
Sources: ADOT 5-Year Transportation Facilities Construction Program; MCDOT Transportation Improvement Program FY 2007-2011; MAG Transportation Improvement Program FY 2008-2012				
Maricopa County – Private				
Tuthill Rd.	Pecos Rd. to Queen Creek Rd.	Pave dirt road	FY 2008	$1,960,000
	0.5 miles N. of Narramore Rd. to Narramore Rd.	Add southbound through lane		
Narramore Rd.	0.5 miles E. of Tuthill Rd.	Add westbound through lane	FY 2008	$1,000,000
Pinal County				
Warren Rd.	Century Rd. to Fresno	Design, new construction	FY 2006-07	$700,000
McCartney Rd.	Cox Rd.	Turn lanes – design, new construction	FY 2006-07	$150,000
McCartney Rd.	Overfield Rd.	Intersection design and reconstruction	FY 2006-07	$180,000
McCartney Rd.	Cox Rd.	Add turn lanes: design and reconstruction	FY 2006-07	$150,000
Val Vista Rd.	Hidden Valley Rd. to Warren Rd.	Design, new construction	FY 2007-08	$450,000
Warren Rd.	Fresno Rd. to Robin Rd.	Design, new construction	FY 2007-08	$350,000
Barnes Rd.	Warren Rd. to Hidden Valley Rd.	Design, new construction	FY 2008-09	$350,000
Clayton Rd.	Candlestick Rd. west ¾ mile	Design, new construction	FY 2008-09	$262.500

Table 3.22 Continued

Project	Location	Work	Program Year	Total Cost
Pinal County				
Evans Rd.	Locklin Rd. to McCartney Rd	Design, new construction	FY 2008-09	$262,500
Thornton Rd.	Interstate 8 north one mile	Design, new construction	FY 2009-10	$600,000
Maricopa-Casa Grande Hwy.	Russell, Anderson, Murphy, Val Vista Rds.	Turn lanes – design, new construction	FY 2009-10	$1,200,000
Maricopa-Casa Grande Hwy.	Santa Cruz Wash	Bridge design	FY 2009-10	$250,000
Farrell/Porter Rd.	Santa Rosa Wash	Bridge design	FY 2009-10	$125,000
Hidden Valley Rd.	McDavid to Farrell	Design, new construction	FY 2009-10	Unfunded
Farrell Rd.	Warren to Hidden Valley Rd.	Design, new construction	FY 2009-10	Unfunded
Source: Pinal County Capital Improvements Program, 2006-2007; Pinal County Five-Year Transportation Plan FY 2005-2010				
City of Casa Grande				
Cottonwood Ln.	N/A	Street construction	FY 2006-07	$1,500,000
Doan St. – Phase II	N/A	Street construction	FY 2007-08	$350,000
Early Rd.	N/A	Street construction	FY 2007-08	$550,000
Hacienda Rd	N/A	Street construction	FY 2007-08	$900,000
Henness Rd.	N/A	Street construction	FY 2007-08	$700,000
Kortsen Rd.	N/A	Street construction	FY 2007-08	$600,000
Main Ave.	N/A	Street construction	FY 2007-08	$200,000
McCartney Rd.– Phase I	N/A	Street construction	FY 2007-08	$2,500,000
McMurray Blvd.	N/A	Street construction	FY 2007-08	$1,500,000
Rodeo Rd.	N/A	Street construction	FY 2007-08	$600,000
Sierra St.	N/A	Street construction	FY 2007-08	$150,000
Thornton Rd. – Phase II	N/A	Street construction	FY 2007-08	$1,000,000
Source: Casa Grande 2006-2007 Budget, Capital Improvement Plan				
City of Avondale				
El Mirage Rd.	Southern Ave. to Indian Springs Rd.	Construct 5-lane (2:1:2) arterial	FY 2007	Unknown
Source: Avondale Transportation Plan, October 2006; Avondale Capital Improvement Program, FY 2005-2009, Street Construction Fund Summary				

Table 3.22 Continued

Project	Location	Work	Program Year	Total Cost
City of Goodyear				
Elliott Rd.	185th Ave. to Rainbow Valley Rd.	Reconstruct road from 2 to 4 lanes	FY 2010	$3,750,000
Estrella Pkwy.	MC-85 to Vineyard Ave.	Reconstruct road from 2 to 4 lanes with bridge widening at Gila River	FY 2010	$34,000,000
	Gila River Bridge to Yuma Rd.	Design and construct on-road bike lane	FY 2011	$113,000
Source: Goodyear 5-Year Capital Improvement Plan for Non-Utility Projects FY 2005-2010 and FY 2011-15				
City of Maricopa				
SR-347	Hiller Rd. to Farrell Rd.	Improve to 6-lane Principal Arterial II	FY 2007-08	$1,000,000
Maricopa-Casa Grande Hwy.	SR-347 to White and Parker Rd.	Improve to 6-lane Principal Arterial II	FY 2009-10	$10,800,000
Hiller Rd.	New Alignment	Construct 4-lane Minor Arterial	FY 2009-10	$4,300,000
	Santa Rosa Wash	Construct bridge		
Honeycutt Rd.	SR-347 to White and Parker Rd.	Improve to 6-lane Principal Arterial II	FY 2006-08	$9,100,000
	Santa Rosa Wash	Construct bridge		
McDavid Rd.	Tate Ave. to End	Improve to 4-lane Minor Arterial	FY 2009-10	$1,400,000
Bowlin Rd.	Green Rd. to White and Parker Rd.	Construct 6-lane Principal Arterial I	FY 2007-09	$14,830,000
	Santa Rosa Wash	Construct bridge	FY 2009-10	
	Union Pacific RR	Construct grade separation		
Farrell Rd.	Santa Rosa Wash	Construct bridge	FY 2008-09	$8,900,000
	SR-347 to White and Parker Rd.	Construct 6-lane Principal Arterial II	FY 2009-10	
Green Rd.	Bowlin Rd. to SR-347	Construct 6-lane Principal Arterial I	FY 2008-10	$14,340,000
	Union Pacific RR	Construct grade separation		
Smith Rd.	Farrell Rd. to Bowlin Rd.	Construct 4-lane Minor Arterial	FY 2010	$1,400,000
Porter Rd.	Farrell Rd. to Hiller Rd. Alignment	Improve to 6-lane Principal Arterial I	FY 2006-08	$15,800,000
	Santa Rosa Wash	Construct bridge		
	Union Pacific RR	Construct grade separation	FY 2009	
White and Parker Rd.	Steen Rd. to Hiller Rd. Alignment	Construct 6-lane Principal Arterial I	FY 2006-09	$18,300,000
	Santa Rosa Wash	Construct bridge		
	Union Pacific RR	Construct grade separation		
Garvey Ave.	SR-238 to SR-347	Improve to 4-lane Minor Arterial	FY 2010	$1,700,000
Parallel Rd. Alignment	White and Parker Rd. to Farrell	Construct 4-lane Principal Arterial	FY 2010	$1,080,000
Sources: Maricopa RTP; Maricopa Capital Outlay General Fund FY 2006-2010				

Table 3.23 Planned Short- and Long-Range Roadway Improvements

Route	Location	Type of Work	Fiscal Year	Funding Participation
City of Avondale				
Dysart Rd.	Southern Ave. to Indian Springs Rd.	Construct interim 2:1:2 arterial roadway	FY 2021-26	City
	Gila River	Construct new 6-lane road and bridge over the Gila River		City
Source: Avondale Transportation Plan, October 2006, Table 4-18 Base Roadway Improvements Year 2011 through Year 2026				
City of Casa Grande				
11-Mile Corner Rd. (Phase II)	Selma Hwy. to Hanna Rd.	Reconstruction	FY 2007	Pinal County
Maricopa-Casa Grande Hwy.	Russell Rd. (Maricopa) to Santa Rosa Bridge Casa Grande)	Phase II – expand from 2-lanes to 4-lanes with bridge over a wash	FY 2008	Pinal County
Thornton Rd.	I-8 to Peters Rd.	Reconstruction	FY 2008-10	City, Pinal County
McCartney Rd.	At Cox Rd.	Turn lanes: design, new construction	FY 2006-07	Pinal County
	Peart Rd. to I-10	Reconstruction	FY 2008	City
Val Vista Rd.	Hidden Valley Rd. to Warren Rd.	Design, new construction	FY 2007-08	Pinal County
Warren Rd.	Fresno Rd. to Robin Rd.	Design, new construction	FY 2007-08	Pinal County
Evans Rd.	Locklin Rd. to McCartney Rd.	Design, new construction	FY 2008-09	Pinal County
Barnes Rd.	Warren Rd. to Hidden Valley Rd.	Design, new construction	FY 2008-09	Pinal County
Tweedy Rd.	Hanna Rd. North to Mid-Section Line	Design, new construction	FY 2009-10	Pinal County
Hanna Rd.	Tweedy Rd. West to Mid-Section Line	Design, new construction	FY 2009-10	Pinal County
Hidden Valley Rd.	McDavid Rd. to Farrell Rd.	Design, new construction	FY 2009-10	Pinal County
Farrell Rd.	Warren Rd. to Hidden Valley Rd.	Design, new construction	FY 2009-10	Pinal County
Sources: Pinal County Five-Year Transportation Facilities Construction Program 2007-2010; CAAG Capital Improvements Program 2006-2010; and Pinal County SATS, 5-Year Transportation Improvement Plan				
City of Goodyear				
Chandler Heights Rd.	Rainbow Valley Rd. to one mile west	Pave dirt road	FY 2008	City/ADOT
Bullard Ave.	Riggs Rd. to Hunt Rd.	Pave dirt road	FY 2009	Private
Estrella Pkwy.	MC 85 to Vineyard Ave.	Reconstruct from 2 to 4 lanes; widen bridge over Gila River	FY 2010	City
	Gila River Bridge to Yuma Rd.	Design and construct on-road bike lane	FY 2011	City/ADOT
Elliot Rd.	185th Ave. to Rainbow Valley Rd.	Reconstruct from 2 to 4 lanes	FY 2010	City
Source: MAG Transportation Improvement Program 2008-2012				

Table 3.23 Continued

Route	Location	Type of Work	Fiscal Year	Funding Participation
City of Maricopa				
SR-347	Farrell Rd. to Peters and Nall Rd.	Improve to 6-lane Principal Arterial II	FY 2009-10	ADOT
SR-238	SR-347 to City Limits	Improve to 6-lane Principal Arterial II	FY 2011-25	ADOT
Maricopa-Casa Grande Hwy.	White and Parker Rd. to Anderson Rd.	Improve to 6-lane Principal Arterial II	FY 2011-25	City, County
Honeycutt Rd.	White and Parker Rd. to Anderson Rd. Alignment	Construct 6-lane Principal Arterial II	FY 2011-25	City
	Santa Cruz Wash	Construct bridge		
Bowlin Rd.	White and Parker Rd. to Anderson Rd. Alignment	Construct 6-lane Principal Arterial I	FY 2011-25	City
	Santa Cruz Wash	Construct bridge		
Farrell Rd.	Hartman Rd. to Anderson Rd. Alignment	Construct 4-lane Minor Arterial	FY 2011-25	City
	Parallel Rd. Alignment to Hartman Rd.	Construct 6-lane Principal Arterial II		
	Santa Cruz Wash	Construct bridge		
	Green Rd. to SR-347	Improve to 4-lane Minor Arterial		
Green Rd.	Bowlin Rd. to Farrell Rd.	Improve to 4-lane Minor Arterial	FY 2011-25	City
Main Rd.	McDavid Rd. to Bowlin Rd.	Construct 4-lane Minor Arterial	FY 2010	City
Smith Rd.	Peters and Nall Rd. to Farrell Rd.	Improve to 4-lane Minor Arterial	FY 2011-15	City
Porter Rd.	Peters and Nall Rd. to Steen Rd.	Improve to 4-lane Minor Arterial	FY 2011-25	City
	Peters and Nall Rd. to Farrell Rd.	Construct 6-lane Principal Arterial II		
White and Parker Rd.	Peters and Nall Rd. to Steen Rd.	Construct 6-lane Principal Arterial II	FY 2011-25	City
Porter Rd. or White and Parker Rd.	Extension	Coordinate new construction with GRIC	FY 2009-10	City, County, ADOT
Parallel Rd. Alignment	Farrell Rd. to Hartman Rd.	Construct 4-lane Minor Arterial	FY 2011-25	City
Smith-Enke Rd.	White and Parker Rd. to Anderson Rd. Alignment	Construct 6-lane Principal Arterial I	FY 2011-25	City
	Santa Rosa Wash	Construct bridge		

Table 3.23 Continued

Route	Location	Type of Work	Fiscal Year	Funding Participation
City of Maricopa				
Steen Rd.	White and Parker Rd. to Anderson Rd. Alignment	Construct 4-lane Minor Arterial	FY 2011-25	City
	Union Pacific RR	Construct grade separation		
	SR-347 to White and Parker Rd.	Improve to 4-lane Minor Arterial		
Peters and Nall Rd.	Murphy Rd. to Anderson Rd.	Construct 4-lane Minor Arterial	FY 2011-25	City
	Maricopa-Casa Grande Hwy. to White and Parker Rd.	Construct 6-lane Principal Arterial I		
	Union Pacific RR	Construct grade separation		
	Santa Rosa Wash	Construct bridge		
	White and Parker Rd. to SR-347	Construct 6-lane Principal Arterial II		
Fuqua Rd.	Parallel Rd. to Honeycutt Rd.	Construct 4-lane Minor Arterial	FY 2011-25	City
	Peters and Nall Rd. to Maricopa-Casa Grande Hwy.			
Hartman Rd.	Maricopa-Casa Grande Hwy. to Smith-Enke Rd.	Construct 6-lane Principal Arterial I	FY 2011-25	City
	Santa Cruz Wash	Construct bridge		
Murphy Rd.	Maricopa-Casa Grande Hwy. to Smith-Enke Rd.	Construct 6-lane Principal Arterial I	FY 2011-25	City
Anderson Rd.	Maricopa-Casa Grande Hwy. to Farrell Rd.	Construct 4-lane Minor Arterial	FY 2011-25	City
	Farrell Rd. to Smith-Enke Rd.	Reserve right-of-way		
Smith-Enke Rd. or Bowlin Rd.	Extension to Val Vista Rd. or White and Parker Rd.	Coordinate alignment and new construction with GRIC	FY 2011-25	City, County, ADOT
Anderson Rd. or Murphy Rd.	Extension to SR-84	Coordinate alignment and new construction with Ak-Chin Community	FY 2011-25	City, County, ADOT

Source: Maricopa RTP

3.9.11 Existing/Committed Roadway Network

The existing roadway system in the Hidden Valley study area contains two Interstate highways and eight other state highways. The cities of Casa Grande and Maricopa have developed a basic arterial grid network to support their population and economic growth. Lesser roadways in the study area are typically associated with residential subdivisions and commercial enterprises.

Pinal County has identified a set of Routes of Regional Significance (RSR). The majority have been established within the framework of a two-mile grid. The RSRs have been outlined but not specifically identified for programming purposes; this is the purpose of the county's Regional Significant Road Study that is now nearing completion. The Pinal County RSRs in the Hidden Valley study area are listed below.

North-South RSRs (from east to west)

Overfield Road
Sunland Gin Road
Peart Road
Trekkel Road
Thornton Road
Bianco Road
Montgomery Road
Anderson Road
Stanfield Road
White and Parker Road
Smith Road
Green Road
Ralston Road

East-West RSRs (from south to north)

Battaglia Drive
Houser Road
Arica/Connelly Road
Hanna Road
Selma Highway
Kortsen/Kleck Road
Miller/McCartney Road
Val Vista Road
Farrell Road
Honeycutt Road
Smith Enke Road

3.10 Transit and Rail

3.10.1 Public Transportation

Greyhound Lines operates two intercity bus routes that stop in Hidden Valley communities. Two round trips per day on the Phoenix-Tucson route stop in Casa Grande. Three daily round trips on the Phoenix-San Diego routes stop in Gila Bend. Intercity bus service is privately operated and subject to change without notice.

Several ground transportation services connect Hidden Valley communities to Phoenix Sky Harbor International Airport, the state's busiest. They are:

- Arizona Shuttle, serving Casa Grande and Maricopa
- Central Arizona Transport & Shuttle, serving Casa Grande, Eloy, Maricopa and Stanfield
- Maricopa Shuttle and Limo, serving Casa Grande, Eloy, Maricopa and Stanfield

The National Railroad Passenger Corporation (Amtrak) operates service on the UP mainline across the study area. The combined *Sunset Limited/Texas Eagle* runs three times a week in each direction, stopping in Maricopa westbound to Los Angeles and eastbound to New Orleans and Chicago. Maricopa has the closest Amtrak station to Phoenix.

The Maricopa County Regional Public Transportation Authority, in collaboration with Pima County, operates Route 685, the Gila Bend Regional Connector, between Ajo, Gila Bend and the Desert Sky Transit Center in Phoenix. This route has four round trips per weekday and two round trips on Saturday. Stops are located in

Gila Bend, Buckeye, Goodyear, Avondale and Tolleson. Between Gila Bend and Phoenix, buses will deviate up to three-fourths mile from the fixed route to receive and discharge passengers.

The City of Maricopa, with funding assistance through the federal Section 5311 small urban and rural transit program, recently initiated the weekday Maricopa Express (MAX) on two routes connecting Maricopa with central Phoenix and Tempe. The Phoenix route makes two inbound trips in the morning and two outbound trips in the afternoon, connecting a park-and-ride lot in Maricopa with seven stops in downtown Phoenix and at the state capitol. The newer Tempe route operates the same number of trips, but in the middle of the day. These trips serve seven Tempe stops from Arizona Mills Mall to the downtown/ASU transit center. One-way fares for both routes are $3.00 for adults and $2.00 for seniors, but monthly and multi-trip passes are available.

Private, non-profit social service organizations offer transportation services to the elderly and handicapped throughout Arizona. These organizations are eligible for grant funds to purchase vehicles and other capital equipment under the federal Section 5310 program that ADOT administers. According to the ADOT website, Section 5310-funded services are available in the Hidden Valley communities of Avondale, Buckeye, Casa Grande, Eloy, Gila Bend and the Gila River Indian Community.

3.10.2 Rail Freight Service

The Sunset mainline of the UPRR crosses the southern portion of the Hidden Valley in a generally east-west direction, passing through Gila Bend, Maricopa, Casa Grande and Eloy. The route accommodates approximately 55 to 65 freight trains per day; this volume may double when the UP finishes double-tracking the line by 2011. There are many at-grade roadway crossings which can cause substantial traffic delays, especially at the busiest crossings such at SR-347 in Maricopa. Because of the heavy demand from freight customers, the railroad has indicated that it is unwilling to consider additional passenger service within the existing right-of-way.

3.11 Related Studies and Reports

This section summarizes 75 studies considered pertinent to the Hidden Valley Transportation Framework Study. They are grouped according to status: completed (within the last ten years), in progress, and future.

3.11.1 Completed Studies

1. **Pinal County Open Space and Trails Master Plan**

   Date Completed: October 2007
   Lead Agency: Pinal County
   Author: Logan Simpson Design Inc.

   Purpose: To serve as the foundation of the Open Space and Recreation Element of the *Pinal County Comprehensive Plan*. It reflects the vision of county residents, and identifies goals and objectives for the attainments of open space, trails and regional parks.

   Study Area: Pinal County.

   Process: The process included project initiation (definition of scope and project schedule); inventory and analysis; public participation (with six public meetings and four stakeholder task force meetings); values/issues/needs identification; establishment of vision, goals and objectives; development of three conceptual master plan alternatives; preferred master plan alternative; preliminary master plan; and draft/final master plan

   Recommendcations Relevant to Study Area: The plan identifies 399,300 acres of existing or planned open space throughout the county, along with 802,400 acres of proposed open space, 25,900 acres of restricted-use open space, and 168,700 acres of regional parks.

2. Casa Grande SATS

Date Completed: July 2007
Lead Agency: City of Casa Grande
Author: Wilson and Company

Purpose: The purpose of this study was to develop a transportation plan that will guide multi-modal planning and programming on local roads over a 20-year timeframe. Key tasks included a roadway safety evaluation of key corridors, development of 2015 and 2030 population and employment forecasts, travel demand forecasting, assessment of transportation employment needs, and revenue forecasts.

Study Area: Casa Grande.

Process: The study extends the goals and objectives of the Casa Grande General Plan 2010, outlines the population and employment forecasts for the study area and details roadway improvements to accommodate future travel demand for 2010, 2020, and 2030.

Recommendations Relevant to Study Area: This study recommends the arterial grid network at two-mile interval, and further study of new expressways along Montgomery Road and Val Vista Boulevard possibly connecting with I-8 and I-10 to create a high-capacity loop system. Four new system interchanges at Montgomery Road and I-8, Montgomery Road and SR-238, Montgomery Road and Val Vista Boulevard, and I-8 and Val Vista Boulevard are proposed. Eleven new TIs are proposed along various high-capacity roadways that lie within the Hidden Valley study area. More generally, the study identified more than 87 additional centerline miles and nearly 600 new lane miles of needed roadway improvements. It also included recommendations for commuter transit service and local starter transit service.

3. Central Arizona Transmission System – High Voltage, 2016 Transmission Study

Date Completed: July 2007
Lead Agency: SRP
Author: K.R Saline and Associates, PLC

Purpose: In 2005-2006, the CATS-HV subcommittee completed a saturated load study to identify what the total electric load between Phoenix and Tucson could ultimately be if land development occurs according to county and municipal general plans in the region. This study by the CATS-HV subcommittee studied the transmission system for the year 2016 to investigate the performance of the coordinated 2016 ten-year plans and the ability of the planned CATS-HV system to accommodate the local growth beyond the forecast for 2016.

Study Area: The study area spreads over Maricopa, Pinal, Pima and Gila counties, with the largest portion lying in Pinal County. It extends from Mobile in the west to Christmas (in Gila County) in the east, and from Magma in the north to Cortaro in the south.

Process: The CATS HV subcommittee studied the CATS HV transmission system for the year 2016 to investigate the performance of the coordinated 2016 ten-year plans for the study area. It also took into account the potential local system impacts of delayed, cancelled, or initially out-of-service high voltage (HV) and extra high voltage planned projects in Arizona, and the ability of the planned CATS-HV system to accommodate local load growth beyond that forecast for 2016.

Recommendations Relevant to Study Area: The study increased the load in the study area in 100 megawatt increments above the level modeled in the 2016 base case. The generation used to offset the increased load was dispatched equally from simulated generation modeled at Palo Verde and Tortolita substations. As next steps, the study recommends evaluation of the CATS-HV system with the potential development of generation resources locally. The proposed generation and transmission system will have significant implications for the Casa Grand Generating Station, which lies within the Hidden Valley study area.

4. City of Maricopa Transit Feasibility Review and Implementation Plan

Date Completed: July 2007
Lead Agency: City of Maricopa (with ADOT)
Author: Parsons Brinckerhoff

Purpose: The purpose of the study was to determine the feasibility of a public transportation system for the residents of Maricopa.

Study Area: Maricopa.

Process: Based on quantitative analysis and qualitative input from the community, the feasibility review identified clear patterns of travel into Maricopa County.

Recommendations Relevant to Study Area: The study recommends a set of near-term, mid-term and long-term transit initiatives. Near-term actions include creating a transit coordinator position and implementing "pilot" bus service to downtown Phoenix during commute hours, and to south Chandler to serve medical and shopping needs. The study also identifies a neighborhood circulator and dial-a-ride as possible mid-term actions. Other Hidden Valley jurisdictions are expected to closely observe short-term implementation, and may follow Maricopa's example if the service is successful.

5. MAG Regional Transportation Plan (RTP) 2007 Update

Date Completed: February 2007
Lead Agency: MAG
Author: MAG Transportation Policy Committee

Purpose: This study updates the RTP originally adopted in 2003. It includes revised revenue estimates and life cycle programs for freeways/highways, arterial streets, and transit projects.

Study Area: Maricopa County.

Process: The update was developed as an amendment to the RTP, formed through a cooperative effort of government, business, public interest groups and the community at large.

Recommendations Relevant to Study Area: No new projects are programmed in the Hidden Valley.

6. Pinal County Corridor Definition Study

Date Completed: September 2006
Lead Agency: ADOT Transportation Planning Division
Author: Kimley-Horn

Purpose: The purpose of the study was to further review recommendations of the Southeast Maricopa/Northern Pinal County Transportation Study.

Study Area: This study included the eastern portion of Casa Grande.

Process: Using the previous study recommendations as a basis, the study made corridor definition recommendations based on an analysis of existing and future conditions.

Recommendations Relevant to Study Area: The study identified a north-south corridor just east of the study area. This north-south corridor will need to be considered when developing the Hidden Valley Transportation Framework.

7. Avondale Transportation Plan

Date Completed: October 2006
Lead Agency: City of Avondale
Author: The CK Group Inc.

Purpose: The study developed a citywide transportation plan to address future transportation needs based on anticipated growth. The transportation plan will be used as a tool to identify these future needs and devise means to fund future projects.

Study Area: The study area is bounded by 99th Avenue on the east, Indian School Road on the north, Dysart Road on the west, and Indian Springs Road on the south.

Process: The plan identified potential transportation infrastructure needs and set the course for undertaking transportation projects to adequately serve the future travel demand of the city. Achievable goals set forth in the city's general plan guided the development of the plan using a public outreach process.

Recommendations Relevant to Study Area: The plan recommends roadway capacity improvements including: widening of existing arterials, bridge widening, new bridges over the Gila River, and development of a collector system south of Lower Buckeye. These recommended improvements, as well as other identified future improvements, need to be considered when developing the Hidden Valley Transportation Framework.

8. Maricopa County Eye to the Future – Old US 80 Area Plan

Date Completed: August 2006
Lead Agency: Maricopa County
Author: Maricopa County Planning and Development Department

Purpose: This study is a new plan that focuses on portions of the State Route 85 Area Plan and the Tonopah/Arlington Area Plan to accurately reflect community needs for growth and development.

Study Area: This study follows Old US 80 from Baseline Road on the north and Fornes Road on the south.

Process: This plan contains a series of goals, objectives, and policies used to define development standards, guide public investment, and guide public and private decision-making.

Recommendations Relevant to Study Area: Priorities in the plan, reflecting public input, center on preparing for and accommodating future growth. This plan seeks to enhance cooperation between government agencies, citizens and other affected interests, as well as to consider regional implications of growth. The area will be mostly rural residential, with proposed open space along river corridors, industrial uses near the PVNGS, and mixed use near Lewis Prison and the Buckeye Airport.

9. Pinal County SATS

Date Completed: August 2006
Lead Agency: Pinal County
Author: Kirkham Michael

Purpose: This plan evaluates the county's transportation needs, including roadway and transit elements, over the next 20 years.

Study Area: Pinal County.

Process: The planning process was an extension of the Comprehensive Plan update in 2001 to more fully understand and develop the county's future transportation needs and network.

Recommendations Relevant to Study Area: The transportation plan for Pinal County does not recommend any new freeways within the Hidden Valley study area. The arterial grid network is spaced at two- to four-mile intervals, with most arterials recommended as six-lane facilities by 2025.

10. Eloy Subdivision Ordinance

Date Completed: August 2006
Lead Agency: City of Eloy
Author: City of Eloy

Purpose: The purpose of the Subdivision Ordinance is to provide for the orderly growth and harmonious development of Eloy; to ensure adequate vehicular and pedestrian traffic circulation through coordinated street systems, to achieve individual property lots of reasonable utility and livability, to secure adequate provisions for water supply, drainage, flood protection, sanitary sewerage, and other health and safety requirements, to ensure consideration for adequate sites for schools, recreation areas, and other public facilities; to promote the conveyance of land by accurate legal description, and to provide practical procedures for the achievement of this purpose.

Study Area: Eloy.

Process: Ordinance 06-624 passed on August 14, 2006, updated the entire Eloy code which includes the Subdivision Ordinance.

Recommendations Relevant to Study Area: The Subdivison Ordinance requires adequate connectivity of existing and future roadway networks. New roadway networks approved by the city council will need to be considered when developing the Hidden Valley Transportation Framework.

11. Pinal County ADMP Phase A – Coolidge Watershed

Date Completed: July 2006
Lead Agency: Pinal County
Author: Entellus

Purpose: The purpose of this study is to anticipate potential flooding problems that may occur due to impending development, and to identify guidelines for development that will minimize flood damage within the study area as urbanization occurs.

Study Area: Coolidge watershed, within the Coolidge/Casa Grande area.

Process: Data collection for this study identified flood and erosion hazards in the study area, inventoried existing drainage facilities, delineated watersheds, and identified potential split flow locations. The study then developed policies and strategies to protect residents from flood and erosion hazards, while preserving the flood control function of natural washes. Final recommendations were provided for additional technical evaluations.

Recommendations Relevant to the Study Area: The study calls for the construction of a series of storm water channels to convey the runoff through the watershed to the Gila River. Studies of the levees along the river are proposed to provide an adequate level of flood protection.

12. Sonoran Valley Planning Area Major General Plan Amendment

Date Completed: July 2006
Lead Agency: City of Goodyear
Author: RBF Consulting

Purpose: This narrative describes the elements of and justification for a major general plan amendment in Goodyear to establish a land use transportation framework for the Sonoran Valley land area (Patterson Road to Papago Road), allowing the city to expand its current planning area.

Study Area: Bounded by Patterson Road on the north, Papage Road on the south, the Maricopa-Pinal county line on the east, and the Sonoran Desert National Monument boundary on the west.

Process: An analysis of future growth pressures in unincorporated Maricopa County was the catalyst for proposing an amendment to the Goodyear General Plan to include the Sonoran Valley Planning Area. Inclusion of this area will allow the city to address critical land use, transportation and infrastructure issues comprehensively. This document has been submitted for Goodyear City Council approval.

Recommendations Relevant to Study Area: The proposed SR-303 alignment follows the alignment proposed through Estrella, passes through the Montage (Amaranth) Town Center on Farrell Road, and continues south to I-8. Rainbow Valley Road parallels the Sonoran Desert National Monument boundary, providing a continuous roadway from development to the north through development proposed in the Sonoran Valley and potentially farther south. Arterials from Estrella continue south to form a roadway network in the State Land parcel proposed for development, and looping arterial roads serve the Montage (Amaranth) development.

13. MAG Regional Freeway Bottleneck Study

Date Completed: May 2006
Lead Agency: MAG
Author: Olsson Associates

Purpose: The purpose of the Freeway Bottleneck Study was to identify and analyze bottlenecks, to evaluate freeway Level of Service, and to rank projects to mitigate the bottlenecks.

Study Area: Maricopa County.

Process: In 2001, an aerial survey was conducted that identified 16 congested freeway segments or "bottlenecks." A freeway operations model was used to analyze these bottlenecks and evaluate possible solutions.

Recommendations Relevant to Study Area: None of the bottlenecks are located within the Hidden Valley study area.

14. El Rio Watercourse Master Plan

Date Completed: March 2006
Lead Agency: FCDMC
Author: Stantec Consulting Inc.

Purpose: The plan is intended to examine a range of flood control management plans that will foster maintenance and enhancement of the Gila River.

Study Area: The plan encompasses the Gila River from its confluence with the Agua Fria River westward to its crossing of SR-85.

Process: Development of the plan entailed identification of flood and erosion hazards, a definition of river characteristics, incorporation of stakeholder concerns, minimization of future spending of public funds, and consideration of environmental characteristics and multiple-use activities. Several alternatives were considered and evaluated based on public safety, social, economic, and environmental criteria.

Recommendations Relevant to Study Area: The final recommended alternative was a combination of soft-structural and non-structural elements with resource vegetation management. These elements were designed to prevent erosion and follow the 100-year floodway.

15. Estrella Mountain Ranch/Goodyear General Plan Amendment

Date Completed: March 2006
Lead Agency: Newland Communities
Author: DMJM Harris (now AECOM)

Purpose: This narrative describes the elements of and justification for a major general plan amendment in Goodyear to establish a transportation framework for the master-planned community of Estrella Mountain Ranch, including arterial roadway and transit options, as well as a plan for the extension of SR-303 south of I-10 and across the Gila River.

Study Area: Estrella Mountain Ranch Master-Planned Community in Goodyear.

Process: This document has been submitted for Goodyear City Council approval.

Recommendations Relevant to Study Area: The proposed SR-303 alignment follows the east side of Waterman Wash, south to I-8 through a combination of privately owned and BLM land. Arterial roadway connections outside Estrella Mountain Ranch generally follow the one-mile, section line grid network.

16. Maricopa General Plan 2006

Date Completed: January 2006
Lead Agency: City of Maricopa
Author: Willdan, David Williams and Associates

Purpose: The Maricopa General Plan 2006 is the city's first general plan and a statement of the citizens' vision for the future of the city. It gives policy direction to guide the physical and economic development of Maricopa and its planning area.

Study Area: Maricopa's 270 square-mile planning area.

Process: Extensive public participation was conducted to understand existing conditions and develop a vision for the future development of the Maricopa.

Recommendations Relevant to Study Area:
The entire planning area of Maricopa lies within the Hidden Valley study area. From 5,000 people in 2004, Maricopa is expected to grow to a population of over 100,000 in 2010. The general plan outlines medium-density residential, with a number of master planned communities along SR-238 and SR-347, south of the Ak-Chin Indian Community where the city has room to expand. Office and employment uses are planned along the Maricopa-Casa Grande Highway (SR-238). Other employment nodes are the Nissan Proving Grounds, Volkswagen Proving Grounds and Phoenix Regional Airport area. Among the transportation and circulation recommendations, improvements to SR-347, including additional capacity and a railroad overpass, are the most prominent.

17. SR-85 Access Management Study, I-8 to I-10

Date Completed: September 2005
Lead Agency: ADOT
Author: DMJM Harris (now AECOM)

Purpose: The purpose of this study was to provide ADOT, Maricopa County, the Town of Gila Bend, and the Town of Buckeye with a cost-effective plan to manage access on SR-85 and to provide guidance for future development adjacent to this corridor during the phased conversion of SR-85 to a fully access-controlled (freeway) facility, beginning with short-term improvement to a four-lane divided highway.

Study Area: The study area is a one-mile-wide strip centered on SR-85, extending from I-8 on the south to I-10 on the north.

Process: This study reviewed population and land use projections, projected access locations, proposed developments and roadways, traffic projections, and future traffic analyses to determine the best access management strategy for the corridor. A vision of the desirable future of SR-85 was developed, along with supporting documentation on how best to implement the plan.

Recommendations Relevant to Study Area: Interim recommendations for access management along SR-85 include several new at-grade interchanges in the Hidden Valley study area. In part because of its strategic role as part of the CANAMEX corridor, the ultimate recommendation for SR-85 is a fully access-controlled highway built to Interstate standards, with access only at grade-separated interchanges. A continuous two-way frontage road will be constructed from the Gila River bridge to Gila Bend to provide local access.

18. Maricopa RTP

Date Completed: July 2005
Lead Agency: City of Maricopa
Author: Lima and Associates

Purpose: This study presents goals, strategies and facilities to accommodate current and future travel demand, in order to develop an efficient multimodal transportation system.

Study Area: Maricopa.

Process: This project involved an intensive public participation process to help analyze existing conditions and develop the transportation plan, including a transit element.

Recommendations Relevant to Study Area: Maricopa has a series of principal and minor arterial roadways. SR-347 is the primary north-south access route in and out of the community and SR-238 the primary east-west roadway. It is recommended that additional north/south regional connection be considered to accommodate growth and to provide alternatives to SR-347. A connection to I-10 east of Maricopa along an alignment such as Bowlin Road or a continuation of Smith-Enke Road could provide an additional route for travel to and from the community.

19. Palo Verde Hub to TS-5 500 kV Transmission Line Project

Date Completed: June 2005
Lead Agency: APS
Author: Environmental Planning Group

Purpose: This study planned electrical transmission infrastructure to bring bulk power into the high-growth area west of the White Tank Mountains. The project also will strengthen the entire APS transmission system by providing an additional high-voltage transmission source to the Phoenix metropolitan area, allowing importation of power from generating sources at or around the PVNGS.
Study Area: The study area has an irregularly shaped border that extends approximately four miles north of the Central Arizona Project Canal, four miles south of the PVNGS, two miles west of Harquahala Valley Road, and two miles east of Sun Valley Parkway.

Process: In addition to general land use and environmental analysis, adherence to the National Environmental Policy Act was required, causing APS to work with the BLM to a file right-of-way application and conduct an EA. A public involvement program was conducted simultaneously with the EA.

Recommendations Relevant to the Study Area: The recommended transmission line will begin at the Palo Verde Hub at either the PVNGS or future Arlington Valley Energy Facility, and proceed northwest. Within the study area, this transmission line will connect to the Hassayampa Switchyard, Redhawk

Power Plant, Mesquite Power Plant, Arlington Power Plant, and the proposed 20-acre Arlington Valley Energy Facility Switchyard.

20. Maricopa ADMP

Date Completed: January 2005
Lead Agency: Pinal County
Author: Stantec

Purpose: The purpose of this study was to anticipate potential flooding problems that may occur due to impending development, and to identify guidelines for development that will minimize flood damage within the study area as urbanization occurs.

Study Area: 322 square miles in unincorporated Pinal and Maricopa Counties, including the community of Stanfield and portions of Maricopa.

Process: Data collection for this study identified flood and erosion hazards within the study area, inventoried existing drainage facilities, delineated watersheds and identified potential split flow locations. The study then developed policies and strategies to protect residents from flood and erosion hazards, while preserving the flood control function of natural washes. Final recommendations were provided for additional technical evaluations.
Recommendations Relevant to the Study Area: Storm water conveyance channel network improvements, improvements to the drainage management system in distributive flow areas that cause road erosion at roadway-wash crossings, and improvement guidelines for retention and detention basins are recommended for the entire study area. Important channels in the Hidden Valley study area are the SR-238 channel, Hidden Valley Road Channel and Stanfield Channel.

21. Corridor Improvement Study: SR-303 between Riggs Road and MC-85

Date Completed: March 2004
Lead Agency: Maricopa County Department of Transportation (MCDOT)
Author: Parsons Transportation Group

Purpose: This section of SR-303 is considered a potential high-capacity, north-south highway for service to the West Valley and South Goodyear/Estrella Mountain Ranch. The study sought to define a corridor within which to locate a future access-controlled facility.

Study Area: SR-303 from MC-85 to Riggs Road.

Process: A corridor-level investigation examined engineering and planning factors to develop a full range of options that led to a preferred corridor alternative.

Recommendation Relevant to Study Area: Recommendations include increasing the capacity of the traffic network in the study area. The analysis of proposed alternatives found two feasible options and recommended preservation of both corridors until future study can determine the best course of action. One alternative would follow approximately the Cotton Lane alignment to a new Gila River crossing, while the other would veer west south of I-10, crossing the river near Perryville Road. (In April 2006, Newland Communities, master developer of the planned community of Estrella Mountain Ranch, submitted a major general plan amendment to Goodyear, recommending a change in alignment south of Pecos Road, going around and through this community.)

22. Eloy General Plan

Date Completed: 2004
Lead Agency: City of Eloy
Author: URS Corporation

Purpose: The Eloy General Plan provides a long-term vision for Eloy's development that guides residents and other stakeholders in directing future growth of the city.

Study Area: The Eloy planning area. However, the study area does not cover the entire 71 square miles within the Eloy city limits.

Process: Public involvement and outreach was used to conduct an existing conditions assessment and devise a vision for the future direction of growth desired by the community.

Recommendations Relevant to Study Area: Within the study area limits, a large tract of land flanking the eastern edge of I-8 to Peart Road is planned for mixed-use development is proposed off I-8. Elsewhere low- to medium-density residential will remain the dominant use.

23. Palo Verde to Southeast Valley/Browning Transmission Project

Date Completed: 2004
Lead Agency: SRP
Author: Greystone Environmental Consultants

Purpose: This study is a result of the Central Arizona Transmission System Study to determine new power line transmission capacity for central Arizona. The objective is to analyze system reliability, capacity and increasing demand for energy delivery, and to plan for any additional required transmission. The project began as one, but was subsequently divided in two, Palo Verde to Pinal West and Pinal West to Southeast Valley/Browning, both within the Hidden Valley study area.

Study Area: The Palo Verde to Pinal West portion follows the El Paso Natural Gas Line Road alignment on the south, bordering the Sonoran Desert National Monument, and extends approximately six miles north and east of this alignment, originating at the Hassayampa Substation and terminating at the Pinal West substation. The Pinal West to Southeast Valley/Browning portion encompasses the entire Pinal County portion of the Hidden Valley study area and extends beyond this boundary to the Browning substation in Apache Junction.

Process: An extensive siting process was conducted to determine the most appropriate location for the power line, involving a land use and environmental analysis as well as an extensive public outreach program.

Recommendations Relevant to the Study Area: The preferred 500 kV transmission line alignment runs south from the Red Hawk substation until it meets El Paso Natural Gas Line Road, and then follows this rural road to the Pinal West Substation. From the substation, it continues east along the southern boundary of the Ak-Chin Indian Community, turning south along Murphy Road and east again along Cornman Road (three miles north of I-8) to Casa Grande.

24. The Valley's Pedestrian Freeway

Date Completed: 2004
Lead Agency: Valley Forward
Author: HDR Engineering, Maricopa County, SRP

Purpose: This study sought to identify gaps in the trail and open space system throughout Maricopa County.

Study Area: Maricopa County.

Process: Existing and planned trails and regional open space destinations were analyzed for gaps in the system. The results were compiled in a poster map for distribution and education throughout the county.

Recommendations Relevant to the Study Area: The Buckeye Hills Recreation Area and Estrella Mountain Regional Park are identified as Valley "gems" or regional destinations that are significant outdoor public places. Existing trails run from the Gila River to Buckeye Hills Recreation Area and east along the Gila River from Estrella Mountain Regional Park, bordering the GRIC to Phoenix South Mountain Park. A trail is proposed to connect Buckeye Hills Recreation Area to Estrella Mountain Regional Park along the Gila River.

25. Maricopa County Regional Trail System Plan

Date Completed: August 2004
Lead Agency: Maricopa County
Author: Maricopa County Trail Commission

Purpose: This study created a regional planning framework for a 1,521-mile trail network for pedestrians, equestrians, bicyclists, and other non-motorized trail users, expanding upon existing and planned trail systems and seeking to provide connections between municipalities, trails, parks, and neighborhoods, as well as open space corridors to protect natural and cultural resources.

Study Area: Maricopa County.

Process: The Maricopa County Trail Commission was formed in February 2000 to help form a regional trail system, using established trail routes and identifying future trail corridors throughout Maricopa County. The 1,521 miles of the Maricopa County Regional Trail System are organized into segments and priorities that will serve as a guide for implementing the trail plan.

Recommendation Relevant to Study Area: Priority 1 segments are part of the Sun Circle Trail or the Maricopa Trail, including a portion of the Gila River from Estrella Mountain Regional Park to 83rd Avenue and an SRP power line running along the boundary of the GRIC to Phoenix South Mountain Park. Priority 2 segments are important regional corridors that connect to the Maricopa Trail and may provide connections to regional park systems, such as trails along the Gila River west of Goodyear. Priority 3 segments are regional corridors that are not currently key components of the regional trail system, but may become important trails in the future. Most Priority 4 trails are conceptual corridors in outlying areas of Maricopa County, including several in the Hidden Valley study area.

26. MAG Regional Transportation Plan

Date Completed: November 2003
Lead Agency: MAG
Author: URS Corporation; MAG Transportation Policy Committee

Purpose: The RTP was developed and coordinated to provide a comprehensive blueprint for transportation investments in the region through the year 2026.

Study Area: Maricopa County.

Process: The MAG Transportation Policy Committee directed planning and spearheaded an extensive public involvement process.

Recommendations Relevant to Study Area: General recommendations include the development of a Life Cycle Certification Program, consideration of project acceleration and changes in costs of materials, and a re-evaluation of the RTP every five years. Specific recommendations regarding improvements to the arterial, freeway, and transit systems are outlined for the entire county. Programmed projects for the Hidden Valley study area include: right-of-way preservation for SR-303 from the proposed

SR-801 to Riggs Road, new general purpose lanes on SR-85 and I-10, new high occupancy vehicle (HOV) lanes on I-10, specification of the CANAMEX route, and rural bus service along SR-85.

27. Southwest Area Transportation Study

Date Completed: September 2003
Lead Agency: MAG
Author: Wilbur Smith Associates

Purpose: This study was one of three sub-area transportation studies that became a part of the larger RTP for Maricopa County. The goal was to prioritize projects through an identification of the area's transportation needs.

Study Area: The study area is bounded by the Maricopa-Pinal County line on the east, the Maricopa-La Paz and Maricopa-Yuma County lines on the west, I-10 on the north, and I-8 on the south.

Process: A database of information regarding existing and proposed transportation plans, programs and facilities in the study area was compiled by contacting municipalities and agencies. Demographic variables were examined to describe existing and future socioeconomic conditions. Current and future transportation facilities, conditions, options, and major issues were explored.

Recommendations Relevant to Study Area: Recommended projects include expanding the arterial grid network in less developed areas, constructing or reconstructing three Gila River bridge crossings at Rainbow Valley Road, SR-303 and Old US 80, upgrading SR-85 to a freeway, and creating two new freeways (SR-801 and the SR-303 extension south of I-10).

28. Goodyear South Transportation Study, Socioeconomic Data

Date Completed: September 2003
Lead Agency: MCDOT
Author: HDR Engineering

Purpose: This study provides a transportation plan for the area that the extension of SR-303 will serve.

Study Area: The study area covers 340,000 acres from SR-85 on the west to the Pinal/Maricopa County line on the east, and from the Salt River on the north to SR-238 on the south.

Process: A review of current land use, land ownership and development plans was conducted using aerial photography, field surveys and interviews with stakeholders. A system of SAZs and roadway network was prepared to be compatible with the MAG regional SAZ system. This was used to generate socioeconomic data and roadway network data that MCDOT employed in a traffic forecast model.

Recommendations Relevant to Study Area: This study provides base socioeconomic data and a roadway network for the South Goodyear area as background information for the Hidden Valley Study.

29. I-10 National Freight Study

Date Completed: May 2003
Lead Agency: FHWA
Author: Wilbur Smith

Purpose: This study assessed the importance of freight mobility on I-10 to the economy of the corridor states and the nation; identified traffic operations and safety problems that impede freight flow along the I-10 corridor; and evaluated strategies, including intermodal and multimodal strategies, needed to facilitate freight flow in the corridor.

Study Area: I-10 across the United States.

Process: This project gathered information about freight movement, inventoried the physical condition of I-10, identified operational problems for all motorists, and determined what improvements can be made to ease congestion and enhance safety.

Recommendations Relevant to Study Area: Truck movements along I-10 through Arizona are expected to double by 2025. This report suggests that at least three lanes per direction are needed on I-10 between Phoenix and Tucson to accommodate automotive traffic. Additional lanes will be needed to accommodate slower-moving vehicles and allow passing. The study also suggests widening SR-85 between I-8 and I-10, thereby diverting through truck traffic around the Phoenix area to improve economic efficiency and public safety.

30. Maricopa County Eye to the Future – Rainbow Valley Area Plan

Date Completed: January 2003
Lead Agency: Maricopa County
Author: Maricopa County Planning and Development Department

Purpose: This study is an update of a previous area study. It was initiated in response to rapid growth in Rainbow Valley, the evolution of new issues, the availability of new mapping data, and legislation that required new planning elements.

Study Area: Rainbow Valley is bounded by Rainbow Road on the west, Citrus Road on the east, Southern Avenue on the north, and El Paso Natural Gas Line Road on the south.

Process: This plan contains a series of goals, objectives and policies used to define development standards, guide public investment, and guide public and private decision-making. Residents and stakeholders presented new planning objectives and the previous study area was expanded to incorporate new development.

Recommendations Relevant to Study Area: Priorities in the plan, reflecting public input, center on preservation of open space and a rural lifestyle. Most of the planning area overlapping with the Hidden Valley study area is intended to be used for low-density or large-lot residential development. The public also expressed concern with access across the Gila River and the environmental impacts of growth in general, and of all-terrain vehicles in particular.

31. Maricopa County Eye to the Future – State Route 85 Corridor Area Plan

Date Completed: November 2002
Lead Agency: Maricopa County
Author: Maricopa County Planning and Development Department

Purpose: The aim of the plan is to prepare for and accommodate growth throughout the SR-85 corridor for the next ten to twenty years.

Study Area: The study area covers approximately 360 square miles and encompasses SR-85 from I-10 to I-8. The corridor also includes land up to five miles east and west of SR-85, stretching into the towns of Buckeye and Gila Bend.

Process: This corridor plan sets goals, objectives and policies in land use, transportation, environment, economics, growth areas, open space, water resources and cost that will be used to guide development along SR-85. The plan will be re-evaluated and updated periodically.

Recommendations Relevant to Study Area: Future land uses of the area within the Hidden Valley study area (Gila River to I-8) will include industrial employment centers near Lewis Prison and throughout Gila Bend, dedicated open space at the Sonoran Desert National Monument and Buckeye Hills Recreation Area, and open space/rural residential development throughout. Transportation recommendations include upgrading the existing two-lane SR-85 to a four-lane highway.

32. Maricopa County Comprehensive Plan - 2020 Eye to the Future

Date Completed: August 2002 (revised)
Lead Agency: Maricopa County
Author: Maricopa County Planning and Development Department

Purpose: This plan provides a guide for future growth and development throughout Maricopa County.

Study Area: Maricopa County

Process: The planning process was structured to emphasize public involvement and incorporate comments, ideas, and direction into the plan, striving to create strong and vibrant communities within Maricopa County by encouraging orderly development. The plan's elements reflect the character of the county's population, while the goals, policies and implementation tools guide future land use and transportation decisions.

Recommendations Relevant to the Study Area:

The Maricopa County Comprehensive Plan indicates three General Plan Development Areas, or growth areas. These are unincorporated areas that are likely to be annexed by a city or town in the future, and are therefore included in an adopted municipal general plan (and in the MPA for that municipality). The Hidden Valley study area contains part of one such area, consisting of the entire Buckeye MPA south of I-10. Within the study area, Old Highway 80, SR-85, Cotton Lane and Rainbow Valley Road have been categorized as primary roadways, which are significant routes for regional travel that have a high priority for roadway improvements.

33. Avondale General Plan Update 2002-2012

Date Completed: June 2002
Lead Agency: City of Avondale
Author: (Not available)

Purpose: The general plan provides guidance and an implementation framework to achieve a balance between land use, transportation, quality of life, environment and economic prosperity desired by the community of Avondale.

Study Area: The 94-square-mile Avondale MPA.

Process: Citizen involvement, realized through extensive public meetings, was instrumental in creating the vision, goals, objectives and policies of the general plan.

Recommendations Relevant to Study Area:
The general plan outlines the vicinity of the Gila River as a growth area with potential for resort development near the Agua Fria River/Gila River confluence. The plan proposes primarily rural-density residential, office, and employment along the Gila River, and medium-density residential toward the southern edge of the planning area.

34. MAG Long-Range Transportation Plan 2002 Update

Date Completed: May 2002
Lead Agency: MAG
Author: MAG Transportation Policy Committee

Purpose: This study summarizes the current status of the plan and highlights changes made since approval of the 2001 Plan Update. Major changes were deferred pending the preparation of a new RTP.

Study Area: Maricopa County.

Process: The update was developed through a comprehensive planning process and extensive public involvement, and included an evaluation of the transportation needs and impacts of alternative regional growth scenarios.

Recommendations Relevant to Study Area: This plan recommended widening SR-85 between I-8 and I-10.

35. Goodyear General Plan Update 2003-2013

Date Completed: 2003
Lead Agency: City of Goodyear
Author: URS Corporation

Purpose: The general plan provides the foundation for the elements and the implementation program that will guide growth and development decisions in the Goodyear MPA. The planning effort resulted in a consensus-driven vision for the city.

Study Area: The 135-square-mile Goodyear MPA.

Process: Public involvement and outreach was used to conduct an existing conditions assessment and devise a vision for the future direction of growth desired by the community.

Recommendations Relevant to Study Area: The general plan identifies four growth areas: the I-10 corridor, City Center, a rail-air transportation corridor along the railroad and the Phoenix-Goodyear Airport, and the Gila River corridor (which lies within the Hidden Valley study area). The last corridor spans an area approximately one-half-mile wide on each side of the river, projected to house a buildout population of over 12,400 and an employment base of approximately 2,500 jobs. The general plan looks into transit options; a potential north-south light rail corridor has been identified for Estrella Parkway/Pebble Creek Parkway based on its continuity through the planning area. Other options included in the plan are bus rapid transit (BRT) and commuter rail.

36. Pinal County Comprehensive Plan

Date Completed: December 2001
Lead Agency: Pinal County
Author: (Not available)

Purpose: This plan provides a guide for use in future growth and development throughout Pinal County.

Study Area: Pinal County.

Process: The planning process was structured to emphasize public involvement and to incorporate comments and ideas, in an effort to create strong communities within Pinal County by encouraging orderly development. The plan's elements reflect the character of the county's population, while the goals, policies and implementation tools guide future land use and transportation decisions.

Recommendations Relevant to the Study Area: The Transportation Plan illustrates I-8 and I-10 as the only high-capacity roadways in the Hidden Valley area, showing SR-84 and SR-347 as principal arterials and other major grid roadways as major collectors. The plan stresses the need for increased public transportations between rural communities. It will be superseded by the Pinal County Comprehensive Plan Update currently in progress.

37. Maricopa County Eye to the Future – Tonopah Arlington Area Plan

Date Completed: September 2000
Lead Agency: Maricopa County
Author: Maricopa County Planning and Development Department

Purpose: This study updates the previous area plan, which was intended to guide decisions by the Planning and Zoning Commission, Board of Supervisors, policymakers and the private sector.

Study Area: The planning area for this study encompasses the communities of Tonopah and Arlington.

Process: Tonopah and Arlington were addressed as individual planning areas, with a set of goals, objectives and policies used to define development standards and guide public investment, as well as public and private decision-making.

Recommendations Relevant to Study Area: Many of the policy recommendations in the area plan evolved from pre-existing plans in Maricopa County that were adapted to fit the Tonopah/Arlington area. The main transportation objective is the establishment of a countywide circulation system providing safe, convenient and efficient movement of goods and people. The plan recommends, among numerous policies, the development of alternative modes of transportation, maintenance of existing roadways, improved Interstate highway access, and provision of all-weather travel routes over washes.

38. Compilation of Evaluation Data for Designation of the CANAMEX Corridor Through the Maricopa Region

Date Completed: August 2000
Lead Agency: ADOT, MAG
Author: Kimley-Horn and Associates

Purpose: The purpose of this study is to determine, through an evaluation of alternatives, the preferred route of the CANAMEX corridor through the Maricopa County region, and to develop a planning-level cost estimate for constructing corridor improvements.

Study Area: Maricopa County and northern Pinal County.

Process: Eight alternative routes were analyzed and evaluated through Maricopa County based on an extensive data collection effort.

Recommendations Relevant to the Study Area: The recommended alignment enters the Hidden Valley from the north on SR-85, and then proceeds south to I-8 and east to I-10.

39. Buckeye Conceptual Planning

Date Completed: June 2000
Lead Agency: Arizona State Land Department (ASLD)
Author: BRW, Inc.

Purpose: This report outlined the needs for state lands within the Buckeye MPA for the year 2020, based on population and employment projections.

Study Area: Buckeye MPA.

Process: The study used several allocation models to predict the amount of employment, residential dwelling units and population in 2020. Mapping and socioeconomic analyses were also used to estimate future conditions in the study area.

Recommendations Relevant to Study Area: The final conceptual plan outlines land use for approximately 19,900 acres of developable state lands in Buckeye. Approximately 55,000 dwelling units are projected to house a population of 128,000 in 2020. This future development includes 1,936 acres of commercial and employment uses and areas for potential affordable housing.

40. Casa Grande General Plan 2010

Date Completed: 2000
Lead Agency: City of Casa Grande
Author: Partners for Strategic Action

Purpose: The Casa Grande General Plan 2010 is a guide to the type of development that the City wishes to have. Existing physical and economic conditions were combined with future projections to arrive at the most desirable long-range plan for the Casa Grande MPA.

Study Area: Casa Grande.

Process: Extensive public outreach was used to inventory and analyze existing conditions within the city to determine the future direction of growth desired by the community.

Recommendations Relevant to Study Area: The general plan identifies four growth areas: the downtown, the urban core, the urban fringe, and the suburban growth area. Downtown covers the historic center of the city and the plan calls for creating a mixed-use, pedestrian-friendly environment with a multi-modal transportation system and a rail passenger station. The urban core growth area, just outside the downtown, is being planned to support downtown through encouragement of higher-density infill development. The urban fringe is the area where most of the new development is springing up; new infrastructure is needed to support this growth. New TIs and improvements to existing ones on I-10 are suggested, along with multimodal improvements. The suburban growth area covers the outer edges of Casa Grande and is intended to be more rural. The general plan lays emphasis on promoting the use of non-motorized transportation such as bikeways, pedestrian pathways and equestrian trails.

41. MAG Desert Spaces Plan

Date Completed: 1995
Lead Agency: MAG
Author: Design Workshop, Inc.

Purpose: This study identified and recommended conservation and management strategies for natural resources and open spaces critical to quality of life.

Study Area: Maricopa County.

Process: The process included an inventory of existing and potential open space areas and information on topography, hydrology, flora, fauna, land use, ownership and demographics to identify the importance and suitability of open space areas.

Recommendations Relevant to Study Area: Existing parks and wilderness areas are categorized as secured open space. Extensive lands connecting these areas are categorized as retention areas, with some of the land designated as conservation areas.

42. Offsite Emergency Response Plan for Palo Verde Nuclear Generating Station

Date Completed: Unknown
Lead Agency: Maricopa County
Author: Maricopa County Emergency Management Department

Purpose: This plan was created to ensure a coordinated response to protect the public from the effects of radiation exposure in the event of an incident having offsite consequences.

Study Area: The response plan considers all land within a 50-mile radius of the PVNGS, which is located on 4,080 acres near Wintersburg.

Process: This plan outlines necessary responses and communications in case of a serious event. Two emergency planning zones surround PVNGS: the Plume Exposure Pathway zone and the Ingestion Exposure Pathway zone. The Plume Exposure Pathway zone covers a 10-mile radius around the PVNGS and includes evacuation routes for residents. The Ingestion Exposure Pathway zone has a 50-mile radius, denoting the area in which food or potable water could become contaminated as a result of a release of radioactive materials into the atmosphere.

Recommendations Relevant to Study Area: The Plume Exposure Pathway zone outlines evacuation routes from the PVNGS in case of a nuclear event. These evacuation routes follow existing arterial and high-capacity roadways within the Hidden Valley study area, including Elliot Road, Narramore Road, and Old US 80.

3.11.2 Studies in Progress or Completed during Preparation of this Chapter

43. I-10 Corridor Study, DCR and Environmental Study; SR-202 to Junction I-8

Lead Agency: ADOT
Author: DMJM Harris (now AECOM)

Purpose: The purpose of this study is to prepare a DCR and long-range implementation plan for I-10 from SR-202 in Maricopa County to the junction with I-8 in Pinal County. The objective of the proposed improvements is to accommodate projected travel demand, provide an acceptable level of service, and address access and geometric deficiencies in the project corridor.

Study Area: I-10 from SR-202 to the junction of I-8.

Implications for the Hidden Valley Study Area: This study will determine necessary improvements to I-10 through the study corridor, including additional capacity and TI locations. The Hidden Valley study will work alongside the I-10 Corridor Study to incorporate project recommendations.

Project Status: Project initiated spring 2007.

44. ADOT Phoenix-Tucson I-10 Bypass Study

Lead Agency: ADOT
Author: URS Corporation

Purpose: This study will determine whether an alignment for a Phoenix-Tucson I-10 bypass is feasible and if so, designate a preliminary planning corridor for future study.

Study Area: Portions of Maricopa, Pinal, Pima, and Cochise Counties, from approximately Benson to Buckeye, Arizona.

Implications for the Hidden Valley Study Area: The study will determine whether a feasible corridor exists for a high-capacity transportation corridor bypassing Tucson and Phoenix, and connecting to I-10 at both ends. The feasibility and potential routing of a freeway through the Hidden Valley project limits will affect the overall high-capacity supply and demand. If determined feasible, this corridor could be incorporated into the Hidden Valley conceptual transportation framework.

Project Status: Project initiated spring 2007.

45. Multimodal Freight Analysis Study

Lead Agency: ADOT
Author: Wilbur Smith

Purpose: This study will address all modes of freight transportation in Arizona: trucking, rail and aviation. It will provide a detailed assessment of critical freight issues and emerging trends, as well as their relationship to transportation policy and infrastructure. From this information, infrastructure needs and deficiencies will be identified. The study will develop a strategy for establishing freight analysis as an integral part of Arizona's long-range planning process.

Study Area: Arizona.

Implications for the Hidden Valley Study Area: This study will estimate the amount of freight traffic on I-10, I-8, and major rail lines, and the implications of this traffic for future travel demand in the Hidden Valley.

Project Status: Project initiated spring 2007.

46. I-10 Pinal Regional Transportation Profile

Lead Agency: ADOT
Author: Kimley-Horn and Associates

Purpose: This profile study will identify long-range (year 2030) needs and deficiencies on the state highway system, and will recommend potential improvements. The study will also identify the need for and feasibility of potential new corridors in southern Pinal County and northern Pima County. This corridor definition part of the study will be conducted as a separate study called the "Southern Pinal-Northern Pima Corridor Definition Study".

Study Area: Pinal County, northern Pima County, and a small portion of eastern Maricopa County.

Implications for the Hidden Valley Study Area: This study will determine necessary improvements to the state highway system, along with the need for and feasibility of new high-capacity corridors in portions of Pinal and Pima counties. The Hidden Valley study should incorporate project recommendations into its findings.

Project Status: The project began in May 2006, with expected completion originally in mid-2008. The project was temporarily put on hold but regained momentum again in February 2007. (See the next project description.)

47. ADOT Southern Pinal-Northern Pima Corridor Definition Study

Lead Agency: ADOT
Author: Kimley-Horn and Associates

Purpose: This study is a part of the larger Interstate 10-Pinal Regional Transportation Profile study and the main purpose of this study is to identify the need and the feasibility of potential new corridors in southern Pinal County and northern Pima County. It would then further define the corridor recommendations using performance-based evaluation techniques.

Study Area: Pinal County from SR-287 in the north to Tucson in northern Pima County in the south, Tohono O'odham Indian Community in the west and the county boundaries on the east.

Implications for the Hidden Valley Study Area: This study will determine necessary improvements to the state highway system, along with the need for and feasibility of new high-capacity corridors in portions of Pinal and Pima counties. The Hidden Valley study should incorporate project recommendations into its findings.

Project Status: The project began in early 2007, with expected completion in spring 2008.

48. I-10 Corridor Study, DCR and EA; Junction I-8 to Tangerine Road

Lead Agency: ADOT
Author: DMJM Harris (now AECOM)

Purpose: The purpose of this study is to prepare a DCR and long-range implementation plan for I-10 from the junction with I-8 to Tangerine Road. The objective of the proposed improvements is to accommodate projected travel demands, provide an acceptable level of service, and address access and geometric deficiencies in the project corridor.

Study Area: I-10 from the junction with I-8 to Tangerine Road.

Implications for the Hidden Valley Study Area: This study will determine necessary improvements to I-10 through the study corridor, including additional capacity and TI locations. The Hidden Valley study should incorporate project recommendations into its findings.

Project Status: The project began in spring 2006, with expected completion in June 2009.

49. ADOT Statewide Access Management Study

Lead Agency: ADOT
Author: URS Corporation

Purpose: This study will develop an access management classification system for Arizona state highways and a comprehensive access management manual to guide the uniform application of access management throughout the state.

Study Area: State of Arizona.

Implications for the Hidden Valley Study Area: The study will set guidelines and standards for access to all state highways; therefore, it will apply to construction and reconstruction of state highways in the Hidden Valley study area.

Project Status: The project began in the fall of 2005 and had preliminarily drafted functional classifications and access design standards by April 2007. The final report is expected in the fall of 2007.

50. State of Arizona Rail Inventory and Assessment

Lead Agency: ADOT
Author: RL Banks and Associates

Purpose: This study will update the 2000 State Rail Inventory and Assessment Report and develop a 2006 baseline of critical rail infrastructure by reviewing current state railroad policies and objectives, inventorying Arizona railroad facilities, providing a status update on systems and projects, and exploring issues, needs and opportunities for rail on a state level.

Study Area: State of Arizona.

Implications for the Hidden Valley Study Area: Two UPRR freight lines, one of which has limited Amtrak passenger service, traverse the Hidden Valley study area. The "Sunset" corridor through Maricopa and Casa Grande is a major transcontinental freight route that the UPRR is in the process of double-tracking.

Project Status: The project was initiated in spring 2006; the results of this study will be included with the MAG Commuter Rail Study.

51. South Mountain Freeway Corridor Study

Lead Agency: ADOT
Author: HDR Engineering

Purpose: The purpose of this study is to establish a preferred alignment for the SR-202 (South Mountain) Freeway and to perform the necessary environmental studies that will allow final design of the corridor. This freeway is included in the current MAG RTP.

Study Area: The study area is "L"-shaped and can be defined as two regions, the western region and the southern region. The western region is defined from 43rd Avenue to 107th Avenue and from I-10 to the Gila River. The southern region is defined from I-10 to the Gila River and from Pecos Road to Ocotillo Road. In the western region, MAG has recommended a north-south alignment that will hook up with I-10 near 55th Avenue.

Implications for the Hidden Valley Study Area: The routing of a freeway abutting the Hidden Valley project limits will affect future travel patterns and demand throughout the region.

Project Status: ADOT may release a Draft EIS in 2009.

52. SR-85/I-8 DCR and EA

Lead Agency: ADOT
Author: AMEC Infrastructure

Purpose: This project consists of two phases. Phase I was a corridor location study that involved engineering and environmental analyses. Phase II will consist of development and evaluation of preliminary alternatives, resulting in the publication of a Location DCR and EA.
Study Area: SR-85 from Watermelon Road to I-8

Implications for the Hidden Valley Study Area: Planned improvements to SR-85 and I-8 will be incorporated into the findings of the Hidden Valley study.

Project Status: Project was initiated summer 2005 and is in the alternatives evaluation phase.

53. Palo Verde Hub to North Gila 500 kV Transmission Line Project

Lead Agency: APS
Author: Environmental Planning Group

Purpose: This project will site a new 500 kV transmission line that will provide the electrical transmission infrastructure to import additional generation resources from the power plants in and around the Palo Verde Hub (agglomeration of the PVNGS and Hassayampa, Red Hawk, Arlington, and Mesquite substations) into the Yuma area, which is experiencing high growth. The project will also improve the reliability of the APS electric system in the Yuma area by providing an additional high-voltage transmission source

Study Area: The study area extends from the La Paz/Yuma County line on the north to the Barry M. Goldwater Air Force Range on the south, and from the Colorado River on the west to the Palo Verde Hub on the east.

Implications for the Hidden Valley Study Area: The recommended alternative in the EA shows the transmission line running southwest from the Palo Verde Hub and following the UPRR west of the Signal Mountains toward Yuma.

Project Status: The EA was complete in summer 2006, with a Finding of No Significant Impact and a Record of Decision in fall 2006. A Certificate of Environmental Compatibility is expected spring 2007.

54. Eloy General Plan Update

Lead Agency: City of Eloy
Author: HDR Engineering

Purpose: This study will update the current general plan to set a vision on several issues, including downtown revitalization for the city and its 325-square-mile planning area outside the current city limits.

Study Area: Eloy

Implications for the Hidden Valley Study Area: This study will outline the future direction of growth for the city, including a transportation element with the city's mobility goals.

Project Status: Project initiated summer 2007.

55. Eloy SATS

Lead Agency: City of Eloy
Author: Lima and Associates

Purpose: The purpose of this study is to develop a transportation plan that will guide multi-modal planning and programming on local roads for the next 20 years.

Study Area: Eloy

Implications for the Hidden Valley Study Area: This study will outline the future arterial and high-capacity roadway network for Eloy.

Project Status: Project initiated summer 2007.

56. Maricopa Regional Transportation Study Update

Lead Agency: City of Maricopa
Author: Wilson and Company

Purpose: This study will result in a multi-modal transportation plan that will guide planning and programming on area roads over the next 20 years. Wilson and Company is updating the 2005 Maricopa RTP conducted by Lima and Associates.

Study Area: The city of Maricopa plus Casa Grande, the Gila River Indian Community and the Ak-Chin Indian Community.

Implications for the Hidden Valley Study Area: This study will outline the future arterial and high-capacity roadway network for Maricopa, and recommend a long-range, multimodal transportation plan for the Maricopa area. It will consider the feasibility of an inner and outer loop network around the city, along with transit, freight routes, hazardous materials routes and evacuation routes. Regional connections to be studies may include extension of the SR-303 freeway, a potential Val Vista Boulevard connection, and a potential new access to Maricopa through the Gila River Indian Community.

Project Status: The project began in the spring of 2007 and is scheduled for completion in 2008.

57. State Route 347/Union Pacific Railroad Grade Separation Feasibility Study

Lead Agency: City of Maricopa
Author: HDR Engineering

Purpose: This purpose of this study is to develop an engineering project assessment outlining the costs, design parameters, and required right-of-way for a grade separation at the SR-347/UPRR crossing.

Study Area: The vicinity of the UPRR crossing at SR-347..

Implications for the Hidden Valley Study Area: Mobility across the UPRR mainline is a regional transportation issue. The study will recommend alternatives for routing the Maricopa-Casa Grande Highway and Honeycutt Road.
Project Status: Completed.

58. Maricopa-Casa Grande Highway Project Assessment

Lead Agency: City of Maricopa
Author: PBS&J

Purpose: The purpose of the project is to implement a transportation solution that improves safety, access, and mobility, and addresses current and future congestion in this important intercity highway corridor.

Study Area: Maricopa-Casa Grande Highway from SR-347 to Val Vista Road.

Implications for the Hidden Valley Study Area: The Maricopa-Casa Grande Highway is an existing highway and potential future high-capacity corridor in the Hidden Valley. New traffic forecasts are being used to establish both the corridor functional classification and whether grade separations will be needed at major intersections.

Project Status: This project is in the alternatives evaluation phase.

59. Sonoran Desert National Monument and Phoenix South Planning Area RMPs and EIS

Lead Agency: Department of the Interior
Author: BLM, Phoenix Field Office

Purpose: The overarching vision of the BLM in creating an RMP for the Sonoran Desert National Monument and Phoenix South Planning Area is to retain an open and functioning desert ecosystem while still fulfilling multiple-use needs.

Study Area: The Phoenix South Planning Area covers approximately 8.8 million acres in Maricopa, Pinal and Pima counties. It comprises all of the land south of I-10 in the Hidden Valley study area. The Sonoran Desert National Monument RMP study area includes the entire monument, which lies within the Hidden Valley study area except for an outparcel east of the Tohono O'odham Indian Community, located south of the study area.

Implications for the Hidden Valley Study Area: The management plan will include criteria identified for special status species, grazing management, fire management, mineral and energy resources, land, realty and recreation. Issues raised during the scoping process also address preservation of visual resources, transportation and access needs, utility corridor development, and socioeconomic impacts of land use. All of these factors will be used to determine the amount and capacity of public use on BLM land.

Project Status: As of August 2007, the Draft EIS had not yet been released to the public.

60. Gila Bend ADMP

Lead Agency: FCDMC
Author: EEC, Inc.

Purpose: The purpose of this plan is to identify existing drainage problems and develop corrective measures, as well as to develop an overall drainage plan that will provide a tool to ensure that future growth provides adequate storm water conveyance without adversely impacting existing development.

Study Area: The study area is bound by the Gila River on the north, Citrus Valley Road on the west, the Barry M. Goldwater Gunnery Range on the south, and the section line east of the Gila Bend Municipal Airport on the east.

Implications for the Hidden Valley Study Area: This study will identify major drainage issues in a portion of the Hidden Valley study area, which should be considered in roadway planning and placement of river crossings.

Project Status: This project is awaiting FEMA approval of the floodplain delineations.

61. Gila Bend Transportation Master Plan

Lead Agency: Town of Gila Bend
Author: Gannett Fleming, Inc.

Purpose: The purpose of this plan is to prepare a vision that will define the long-term transportation system that Gila Bend needs in the future.

Study Area: Town of Gila Bend

Implications for the Hidden Valley Study Area: This study will outline the future arterial and high-capacity roadway network for Gila Bend and its connections with the region.

Project Status: This project is scheduled to be completed by summer 2008.

62. Waterman Wash Tributaries Floodplain Delineation Study

Lead Agency: FCDMC
Author: EEC, Inc.

Purpose: The purpose of this project is to delineate administrative floodplains and use the resulting maps for floodplain management purposes, as submitted to FEMA for flood insurance purposes and revisions to the Flood Insurance Rate Maps.

Study Area: The study area is locates south of the Gila River between the Maricopa Mountains and the Sierra Estrella Mountains.

Implications for the Hidden Valley Study Area: This study will identify major floodplains within the study area, which should be considered in conjunction with roadway planning.

Project Status: The project is nearly finished; awaiting final public meetings.

63. Tres Rios

Lead Agency: FCDMC
Author: U.S. Army Corps of Engineers

Purpose: This is a development project that will consist of north bank levee improvements, channelization, habitat areas composed of open water marshes and overbank wetlands, and a pump station that will provide water to the habitat areas.

Study Area: The study area is located on the Salt and Gila Rivers from approximately 91st Avenue to the Agua Fria River.

Implications for the Hidden Valley Study Area: This project is completing upgrades to the river bank. Any proposed river crossings in this portion of the study area should be coordinated with this project.

Project Status: The Army Corps of Engineers has completed the design for the first Phase 1A of the north bank levee; Phase 1B north bank levee design continues, presently at the 60% level submittal.

64. MAG Building a Quality Arizona: Statewide Intrastate Mobility Reconnaissance Study

Lead Agency: MAG (with other Metropolitan Planning Organizations and Councils of Governments statewide)
Author: DMJM Harris (now AECOM)

Purpose: This study will develop a long-range vision for transportation infrastructure in the State of Arizona driven by sustainable community and economic development. It will focus on strategic transportation investments designed to complement the local growth and sustainability, and also address critical gaps in the statewide system between existing and future economic activity centers.

Study Area: State of Arizona.

Implications for the Hidden Valley Study Area: This study may identify major high-capacity transportation corridors through the study area, which should be incorporated into the Hidden Valley study.

Project Status: Project initiated April 2007, with expected completion in December 2007.

65. MAG Commuter Rail Study

Lead Agency: MAG
Author: URS Corporation

Purpose: This study is investigating conceptual commuter rail options along the UPPR and BNSF railroad lines throughout the greater Phoenix metropolitan area.

Study Area: Maricopa County and northwest Pinal County.

Implications for the Hidden Valley Study Area: Commuter rail is being considered as a form of high-capacity transit. The city of Maricopa and others have expressed a keen interest.

Project Status: This project began in November 2006, with expected completion in the winter of 2007-2008.

66. MAG I-10/Hassayampa Valley Transportation Framework Study

Lead Agency: MAG
Author: DMJM Harris (now AECOM)

Purpose: The Hassayampa study establishes a framework for a future transportation network in the study area, and provides feedback to local land use and transportation planners on how alternative development scenarios could be part of the regional transportation solution.

Study Area: This project encompasses the land between SR-74 on the north, the Gila River on the south, 459th Avenue on the west, and SR-303 on the east.

Implications for the Hidden Valley Study Area: The Hassayampa Valley area abuts the northern boundary of the Hidden Valley study area and the issues facing the two areas are similar in many ways, although the Hidden Valley area has a larger number of established communities. Hence the two studies will be coordinated as much as the difference in schedules allows. Some proposed high-capacity roadways in the Hassayampa area are likely to serve Hidden Valley as well.

Project Status: This project began in spring 2006 and was completed early in 2008.

67. Historic Gillespie Dam Bridge Rehabilitation

Lead Agency: MCDOT
Author: Archeological Consulting Services, Ltd.
Purpose: This study will develop conceptual design plans for the rehabilitation of the Old US 80 Bridge over the Gila River (Gillespie Dam Bridge), and proposed bridge and adjacent roadway improvements to address forecast area development.

Study Area: The study area includes the bridge, an approximately half-mile segment of Old US-80 from each bridge abutment, and a 228-acre surrounding archaeological survey area.

Implications for the Hidden Valley Study Area: The existing bridge is an important link across the Gila River. The rehabilitation of this bridge, as well as any adjacent roadway improvements, should be incorporated into future transportation planning.

Project Status: This project was initiated fall 2006.

68. Pinal County Comprehensive Plan Update

Lead Agency: Pinal County
Author: Partners for Strategic Action
Purpose: This study is updating the current Pinal County Comprehensive Plan to accommodate recent growth trends.

Study Area: Pinal County, including incorporated cities and towns.

Implications for the Hidden Valley Study Area: This study, an update of the county's comprehensive plan, will be revised to reflect recent and projected growth trends and proposed transportation corridors. The extensive public outreach effort will be especially valuable for the Hidden Valley study.

Project Status: Project initiated March 2007.

69. Pinal County Regionally Significant Routes for Safety and Mobility Concept Study

Lead Agency: Pinal County
Author: Lima and Associates

Purpose: This study identifies a multi-modal county/local integrated system of regionally significant routes to form the backbone of a safe, efficient and dependable transportation network.

Study Area: Pinal County

Implications for the Hidden Valley Study Area: A regionally significant route provides a high level of service for autos and transit, a high degree of access management, a high level of safety, connectivity between urban areas and major activity centers, connectivity to state highways and major urban arterials, and continuity across the county and through urban areas. The final network of such routes will serve as a foundation of the conceptual transportation framework for the Pinal County portion of the study area.

Project Status: The project began in November 2006, the draft final report was released in July 2007, and four public open houses were held in September 2007 to help develop a conceptual implementation plan. The plan will give the county and its stakeholders the tools to maintain and enhance access, mobility, safety, economic development, and environmental quality along the routes.

70. Buckeye General Plan Update

Lead Agency: Town of Buckeye
Author: Partners for Strategic Action

Purpose: This study is an update of the Town of Buckeye's general plan, completed in 2001. The general plan and the town's development code are being completely rewritten to reflect recent and projected growth trends in the area, including the many entitled master-planned communities that are expected to make Buckeye one of Arizona's largest cities.

Study Area: Buckeye MPA.

Implications for the Hidden Valley Study Area: This study will establish a transportation plan and update the current zoning plan for the MPA, which lies partially within the Hidden Valley study area.

Project Status: This project began in March 2006, and is in a 60-day public review period until September 2007. The plan will go to the Town of Buckeye Council in October 2007 with tentative adoption in November 2007.

71. Phoenix Pipeline Expansion Project

Lead Agency: Transwestern Pipeline Company

Purpose: Transwestern Pipeline Company seeks to construct and operate approximately 259 miles of new natural gas pipeline via a connection with the existing system. Customer laterals and meter stations will be built as part of the project.

Study Area: Yavapai, Maricopa, and Pinal counties.

Implications for the Hassayampa Study Area: This pipeline expansion is expected to follow the large utility right-of-way along Komatke Road in Maricopa County, extending from the Pinal County line due east and terminating in Coolidge.

Project Status: The company filed an application for a Certificate of Public Convenience and Necessity in November 2006 with the Federal Energy Regulatory Commission. Construction is expected to begin mid-2007 with service available early 2008.

72. UPRR Study for Reactivation

Lead Agency: UPRR
Author: UPRR

Purpose: The purpose of this study is to evaluate the feasibility of reactivating the UPRR rail line from Palo Verde to Roll, which has been disused since 1996.

Study Area: UPRR rail line from Palo Verde to Roll.

Implications for the Hidden Valley Study Area: This rail line traverses the western portion of the Hidden Valley study area. Its reopening would give the UPRR a through route connecting metropolitan Phoenix with the mainline at both ends, likely spurring industrial development along the rail corridor, providing an alternative to the mainline (Sunset route) farther south, and leading to construction of an intermodal facility in the Palo Verde area.

Project Status: The UPRR has received authorization to reopen this line, but has made no decision yet.

73. 2008 City of Maricopa Parks, Trails and Open Space Master Plan

Lead Agency: City of Maricopa
Author: J2 Engineering and Environmental Design

Purpose: To provide a long-range plan to meet the needs of Maricopa residents for parks, recreation facilities, trails and open space in the growing community.

Study Area:: City of Maricopa.

Project Status: Completed in 2008.

3.11.3 Future Studies

74. ADOT North-South Location/Design Concept and Environmental Study

Lead Agency: ADOT
Author: To be determined

Purpose: This study will designate a preliminary alignment for the Pinal County North-South freeway corridor, from approximately Apache Junction (US-60) to I-10 in the general vicinity of Picacho.

Study Area: Central Pinal County.

Expected Date of Initiation: Request for Qualifications issued December 2007; consultant team selected early 2008.

75. Palo Verde ADMP

Lead Agency: FCDMC
Author: To be determined

Purpose: The purpose of this plan is to quantify the extent of flooding problems and develop cost-effective alternative solutions to reduce flooding hazards.

Study Area: The study is bound by the Central Arizona Project Canal on the north, 355th Avenue on the east, Centennial Wash on the south, and the Palo Verde Hills on the west.

Expected Date of Initiation: Expected summer 2007.

76. Rainbow Valley ADMP

Lead Agency: FCDMC
Author: To be determined

Purpose: The purpose of this plan is to identify flooding hazards and develop alternatives to mitigate these hazards. This plan will also incorporate development plans for the area and jurisdictional drainage policies to develop a preferred solution for the area.

Study Area: The study is bound by the Gila River on the north, the Estrella Mountains on the east, the South Maricopa Mountains on the south and the North Maricopa Mountains on the west.

Expected Date of Initiation: Request for Proposals to be issued in August 2007.

77. Gila River Indian Community SATS

Lead Agency: GRIC
Author: To be determined

Purpose: This plan will evaluate the community's transportation needs, including roadway and transit elements, over the next 20 years.

Study Area: Gila River Indian Community

Expected Date of Initiation: Spring 2008

78. Pinal County Transit Feasibility Study

Lead Agency: Pinal County
Author: To be determined

Purpose: This plan will (1) explore the feasibility of recommendations made in the transit element of the 2006 Pinal County Small Area Transportation Study, and (2) develop an implementation plan for a Pinal County transit system.

Study Area: Pinal County

Expected Date of Initiation: September 2008

79. Gila River Indian Community Transit Feasibility Review and Implementation

Lead Agency: Gila River Indian Community
Author: To be determined

Purpose: The study will review the feasibility of a transit system in the study area; if feasible, it will develop an implementation plan.

Study Area: GRIC planning areas; exact areas have not yet been defined

Expected Date of Initiation: Second half of 2008

Interstate 8 and Interstate 10 Hidden Valley Roadway Framework Study

Chapter 4

Travel Forecasting and Analysis

August 2009

Prepared for

MARICOPA ASSOCIATION of GOVERNMENTS

Prepared by

WILSON & COMPANY

In Association With

AECOM

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Appendix A Traffic Volume Assignments: Tier 2 Alternatives
Appendix B Evaluation of Model Results for Tier 2 Alternatives by Corridor

4.1 Introduction

This chapter summarizes the travel forecasting methodology and Buildout travel demand forecasts (initial and refined) for the roadway portion of the Hidden Valley transportation framework. As part of this study, it was necessary to develop a special set of travel forecasting abilities to support testing and evaluation of long-range (Buildout and 2030) roadway network performance. The travel forecasting method and resulting forecasts provide the basis for identification of projected roadway deficiencies and needs, formulation and evaluation of improvement alternatives, selection of a recommended roadway network, and development of implementation phasing strategies. All travel forecasting activities, including model development efforts and applications associated with this study, were conducted under the direct supervision of MAG staff, with oversight from the funding partners and other affected jurisdictions. The following points outline the process discussed in this chapter:

- MAG received and used general plan land use data, representing Buildout conditions, from jurisdictions in the Hidden Valley study area;
- MAG and its consultants developed conceptual alternative roadway and transit networks in a collaborative effort with affected jurisdictions and agencies;
- The MAG regional transportation model, which is the federally-recognized platform for transportation planning in the MAG region, was refined to reflect travel opportunities to and from the study area;
- The MAG model was used to establish Buildout travel demand in the study area;
- The conceptual alternatives were evaluated with respect to transportation performance and other criteria; and
- Results of the study and findings from the travel forecasting activities will become inputs to regularly updated regional transportation plans prepared by MAG (for Maricopa County) and CAAG (for Pinal County), in accordance with federal requirements.

Future transit services were an important component of the conceptual transportation network alternatives. However, modeling capabilities do not now exist to integrate transit demand with roadway demand. Therefore, although regional transit options were considered, specific transit services were not modeled. Transit development focused on potential commuter rail service; regional bus service; enhanced transit corridors, and potential local transit services areas. Chapters 5 and 6 provide more information on the transit element of the framework.

4.2 Background and Understanding

4.2.1 Focus of Chapter

This chapter focuses on examining roadway network alternatives that will provide a comprehensive basis for preserving rights-of-way for high-capacity roadways. Participants agree that this study offers an ideal opportunity to coordinate future transportation projects and developer plans with local visioning, community planning, and transportation planning efforts. MAG modeling tools helped planners and stakeholders identify and understand projected travel demand in the study area. Model outputs and related travel forecasts provide a rational basis for determining future transportation infrastructure needs, their magnitude, their spatial distribution, and the cost to build the required infrastructure.

To accomplish the forecasting and analysis necessary to identify and evaluate responses to future transportation needs and deficiencies, it is necessary to include sufficient detail for portions of Pinal County in the Hidden Valley study area. The Pinal County model was expanded, updated, and enhanced to improve its reliability and performance for this project. Data from the refined Pinal County model was integrated with the MAG model to permit evaluation of transportation links between Pinal and Maricopa counties.

The initial version of this integrated Hidden Valley travel demand model was used to test a set of general roadway framework alternatives. Each alternative incorporated key high-capacity corridors and a background arterial network. Evaluation of the alternatives permitted transportation planners and stakeholders to identify a recommended roadway network to serve long-range (Buildout) travel demand in the study area. This was accomplished by adjusting roadway functional classification and number of lanes to achieve a reasonable match between the traffic volume assigned to a given roadway and the road's available capacity. This network adjustment and refinement process was repeated until the roadway network largely satisfied evaluation criteria established for the Hidden Valley study (refer to Chapter 5). Chapter 6 summarizes the travel forecasting results for the recommended roadway network derived from the alternatives in this chapter.

4.2.2 Regional Collaboration

In addition to direct collaboration with CAAG on regional planning and programming, MAG led extensive coordination among all funding partners and stakeholders throughout the study. MAG conducted a series of study team meetings and model definition meetings to ensure that model development activities, population and employment projections, and model protocols were consistent with its regional modeling approach. One component of the collaborative effort was validation of the integrated model. Travel forecasts from the integrated model were compared to daily traffic volumes on existing routes in the study area. Table 4.1 summarizes this comparison.

Table 4.1 Summary of Hidden Valley Study Area Traffic Forecast Validation

		2006 ADOT ADT	Base MAG 2006 Model		Enhanced Hidden Valley Model	
Route	Location	Count	Volume	% Difference	Volume	% Difference
SR-85	North of Patterson Rd TI	10,400	12,600	21%	14,000	35%
SR-347	North of Maricopa Rd	41,400	11,200	-73%	37,600	-9%
SR-387	North of Cottonwood Ln	23,500	10,500	-55%	19,500	-17%
I-10	North of SR-387/SR-187 TI	58,100	65,800	13%	60,300	4%
I-10	North of I-8	42,800	43,400	1%	41,700	-3%
North-South Totals		176,200	143,500	-19%	173,100	-2%
SR-84	East of SR-347	3,500	5,400	54%	3,300	-6%
I-8	East of SR-84	6,800	7,800	15%	7,000	3%
SR-238	West of SR-347	5,000	4,900	-2%	6,300	26%
East-West Totals		15,300	18,100	18%	16,600	8%

Source: MAG, August 2009.

As indicated in Table 4.1, the enhanced Hidden Valley model forecasts generally provide a better estimate of actual 2006 ADT volumes than the 2006Base MAG model.

4.2.3 Study Process

The study process involved four steps to guide the study team in developing a reliable travel demand model and formulating feasible long-range transportation framework alternatives. These steps can be summarized as follows:

- Step 1 – Initial network: develop Existing plus Committed roadway framework
- Step 2 – Evaluate Tier 1 alternatives
  - Revise/refine initial network
  - Identify alternative roadway framework plans for more detailed Tier 2 analysis
- Step 3 – Evaluate Tier 2 alternatives
  - Refine model inputs (including Transportation Analysis Zone structure and background roadway network)
  - Test performance of Tier 2 alternatives
- Step 4 – Recommended alternative (described in Chapter 6)

Each step permitted the study team to refine and enhance the travel demand model and adjust or modify the alternatives in accordance with known and projected transportation needs. Figure 4-1 presents a schematic that describes in greater detail the process of travel demand forecasting and establishing alternative networks for evaluation.

Figure 4-1 Steps for Completing the Travel Forecasting and Demand Analysis

4.3 Development of the Travel Demand Model

4.3.1 TransCAD Transportation Modeling Software

The MAG regional transportation model is a comprehensive model used to develop and test air quality conformity of the Regional Transportation Plan (RTP) and the Transportation Improvement Program (TIP) for Maricopa County. Recently, MAG converted its model from EMME/2 to TransCAD. The TransCAD software, which incorporates state-of-the-art geographic information system (GIS) applications, can store, display, manage and analyze large amounts of transportation data. MAG uses it to build and maintain geographic datasets, create and customize maps, perform many types of spatial analysis and evaluate various transportation scenarios. TransCAD is used to model various modes of transportation at various scales or levels of detail. MAG's newly converted regional transportation model permits the MAG planning staff to compare alternative transportation network routings, perform travel demand forecasting, evaluate public transit services, understand logistics requirements, and identify optimum site locations.

4.3.2 Hidden Valley Travel Demand Model Structure

Initial Travel Demand Model

The MAG model was developed for the MAG planning area (Maricopa County). The Hidden Valley study includes portions of the MAG planning area in southwestern Maricopa County, as well as portions of western and north central Pinal County, which lie within the CAAG planning area. Therefore, the initial Hidden Valley travel demand model was developed as a hybrid, expanding the MAG network to include the roadway network defined by CAAG. However, this model proved inadequate for reliably forecasting traffic between the two counties, as the CAAG roadway network consisted almost exclusively of existing major routes, and lacked definition of future regional routes. This required the study team to identify additional modeling resources to be integrated with the MAG model.

Pinal County RSRSM Model Network

Pinal County recently completed a *Regionally Significant Routes for Safety & Mobility Plan* (RSRSM), a study of transportation needs in the county, in cooperation with federal, state and county agencies, as well as local, tribal, and private stakeholders. Many of the participants involved in developing the RSRSM plan, including the cities of Casa Grande, Eloy, and Maricopa and Pinal County, are also engaged in the Hidden Valley study. Development of the RSRSM included definition and construction of a regional roadway network for Pinal County, similar to the one that MAG established for Maricopa County. Like the Hidden Valley study, RSRSM was intended to establish a process to identify and preserve rights-of-way for future travel corridors.

The RSRSM model incorporated high-capacity corridors and a background arterial system. Both the RSRSM and MAG models are based on projections of population and employment, spatially distributed throughout relevant portions of their study areas.

Enhancements to the Hidden Valley Travel Demand Model

Modifications of the Transportation Network Structure

The more detailed transportation network from the RSRSM model was incorporated in the MAG model. This process benefitted from the established partnering approach that Pinal County jurisdictions developed to support the RSRSM planning effort. RSRSM stakeholders were available to help identify solutions for planned regionally significant routes in the Hidden Valley study area. This was important, because the planning horizon of the RSRSM model and model network was 2030, while the focus of the Hidden Valley Study was Buildout (considered likely to occur at least 40 to 60 years from now).

Modifications of the SAZ Structure

Model enhancements focused on modifying the Hidden Valley model structure to include certain socioeconomic analysis zones (SAZ) defined for Pinal County during the RSRSM project. SAZs are the geographical units by which future population and employment projections are disaggregated for use with TransCAD to forecast trips. In transportation modeling, SAZs are generally referred to as transportation analysis zones (TAZ). The modification of Pinal County TAZs facilitated testing of travel demand and network links in the study area, as well as between Maricopa

and Pinal counties. The enhanced Hidden Valley model, while reflecting major components of the RSRSM TAZ network, did not fully use the more tightly defined TAZ structure adopted for RSRSM planning purposes. Rather, TAZ selection corresponded to the larger TAZs that MAG used for southwestern Maricopa County.

Integration of certain RSRSM elements was eventually augmented to provide results more sensitive to the future needs of the Pinal County portion of the study area, especially the rapidly urbanizing communities, such as Maricopa and Casa Grande. Large TAZs were further disaggregated to provide the desired resolution of travel demand and network connectivity associated with the smaller municipalities. Model network enhancements involved creating smaller TAZs in these areas:

- Southern and Central Goodyear;
- Pinal County North-South Freeway Corridor (a proposed ADOT facility);
- SR-802/Williams Gateway Freeway (a proposed ADOT facility);
- RSRSM network;
- City of Casa Grande Small Area Transportation Study network; and
- City of Maricopa RTP Update network.

It was important to plan for adequate future connectivity of the study area with the Pinal North-South Freeway Corridor and the SR-802/Williams Gateway Freeway, as these proposed roadways, although outside the study area, will serve as routes whereby Hidden Valley residents could reach the Phoenix metropolitan area. Figure 4-2 shows how the original MAG RTP/Pinal County RSRSM roadway network was enhanced to permit more reliable modeling of future travel demand and travel patterns. Additional links, shown in blue, were added to the network. Centroid connectors were added to permit the model to load trips from the new SAZ/TAZ structure to the new roadway segments.

Construction of the Trip Table

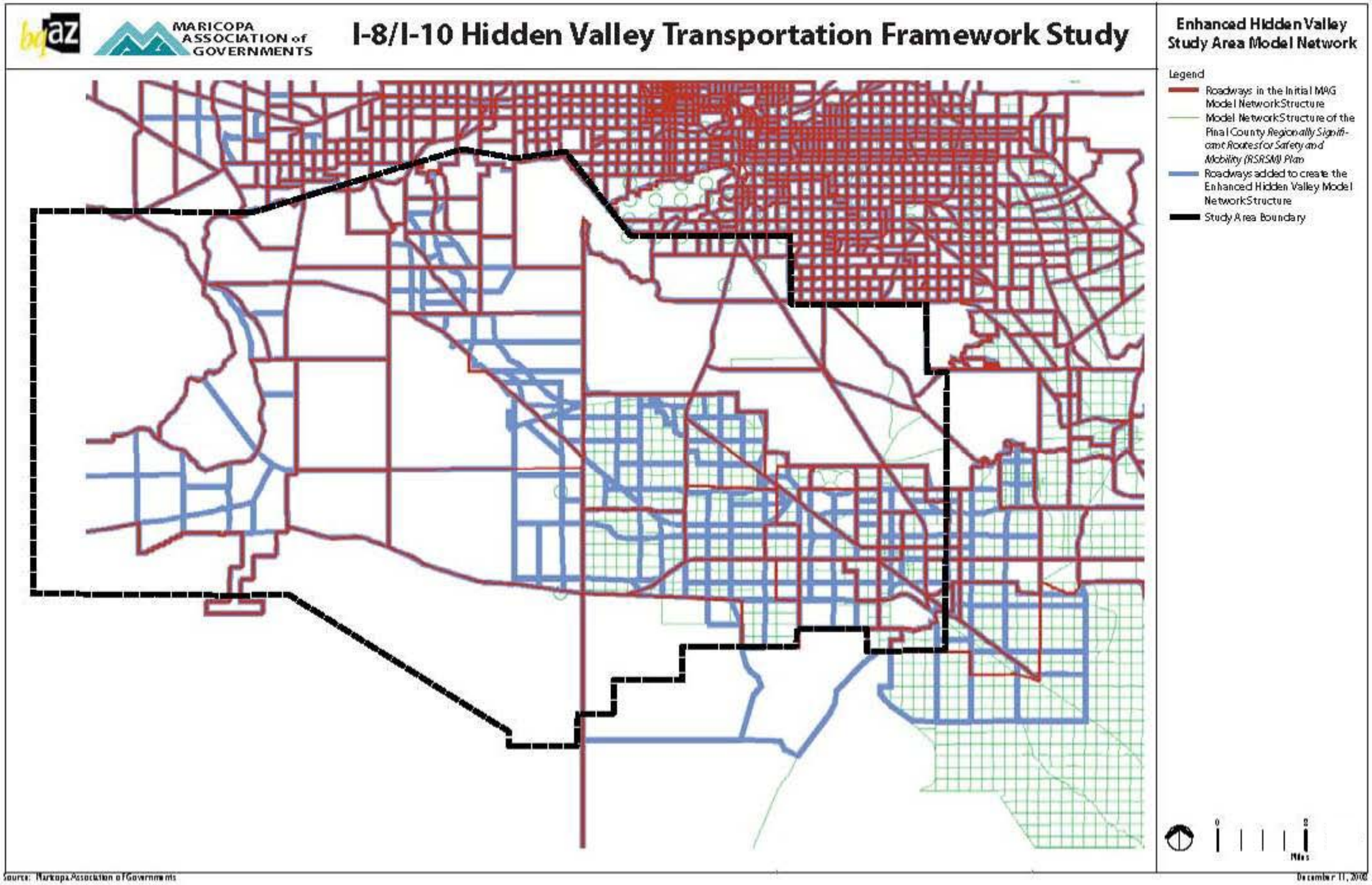
Year 2030 TAZ socioeconomic projections provided the basis for estimating trip origins and destinations (O-D) throughout the study area. Estimating origins and destinations is a way to forecast travel in a region. Each TAZ is represented by a centroid (i.e., a center point), where activity in the zone is considered (as a simplifying assumption) to be spatially concentrated. The transportation system links centroids to carry traffic between their zones.

Abstractly, traffic is created or generated at the origin and moves to the destination. Originating TAZs must have the actual ability to produce the traffic, i.e., travel must be associated with socioeconomic activity and involve the flow of people (and goods). Similarly, the destination must have a real socioeconomic entity (e.g., population or employment) that can absorb the traffic attracted. The simplest representation of traffic is the O-D flow between two centroids. When there are several centroids, the representation can be a list or matrix identifying traffic generated at one centroid moving to a number of others, or traffic attracted to a centroid from a number of others.

A matrix, referred to as an O-D table, can be built to represent all traffic to and from all centroids O-D tables that describe short-duration traffic activity tend to be unbalanced: the total traffic from an origin does not equal the total traffic to that location. This is true of typical home-to-work traffic in the early part of a day: it is unbalanced relative to the centroid of origin. It can be assumed, however, that most workers return to the same residence later in the day (i.e., point of origin); therefore, total home-work-home traffic should be nearly balanced over a full day. A great deal of information can be approximated by making suitable assumptions about balance and imbalance of the parts of an O-D table.

The O-D table constructed for this Hidden Valley study was derived from a compilation of O-D data from the original MAG trip table (built during the initial modeling process) and O-D data from the RSRSM network.

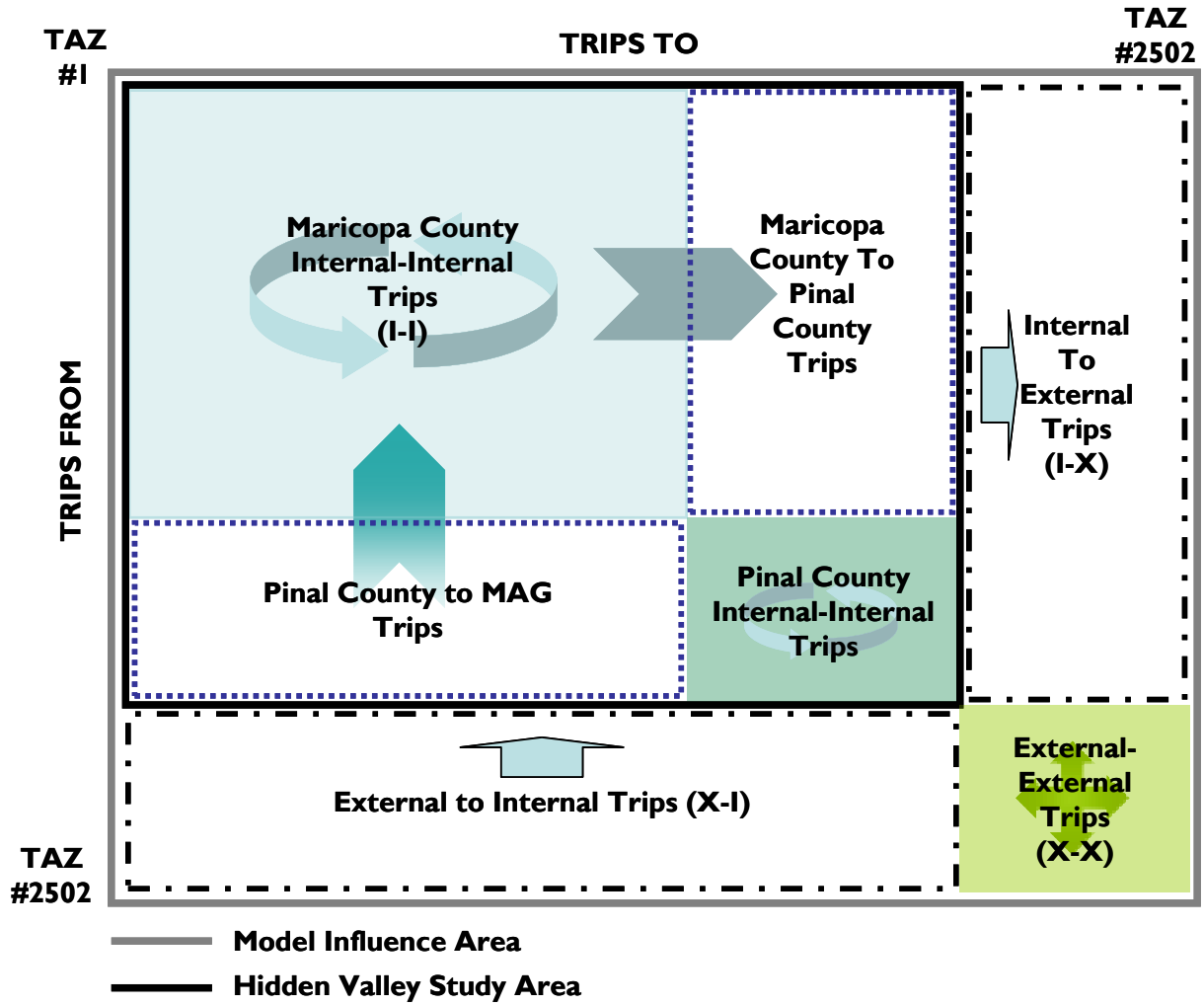
Figure 4-2 Enhanced Hidden Valley Travel Demand Model Network



Adjustments to the O-D Data

Growth assumptions were established for the study area and the TAZs to permit the enhanced model to forecast Buildout traffic movements using the year 2030 socioeconomic projections. The Fratar growth factor method was used to generate a Buildout O-D table from 2030 socioeconomic data. The Fratar method applies growth factors to traffic originating at or destined for the TAZs represented in the 2030 O-D table. The O-D table was adjusted iteratively until an acceptable balance of trips was achieved. Figure 4-3 shows how the MAG team constructed the O-D table of trips within, to, from, and through the study area. Trips within the "Hidden Valley Study Area" defined in this figure were those adjusted by the Fratar method. As a result of this process, the Buildout traffic assignment for the study area network represents 2030 O-D data extrapolated and balanced to reflect Buildout conditions.

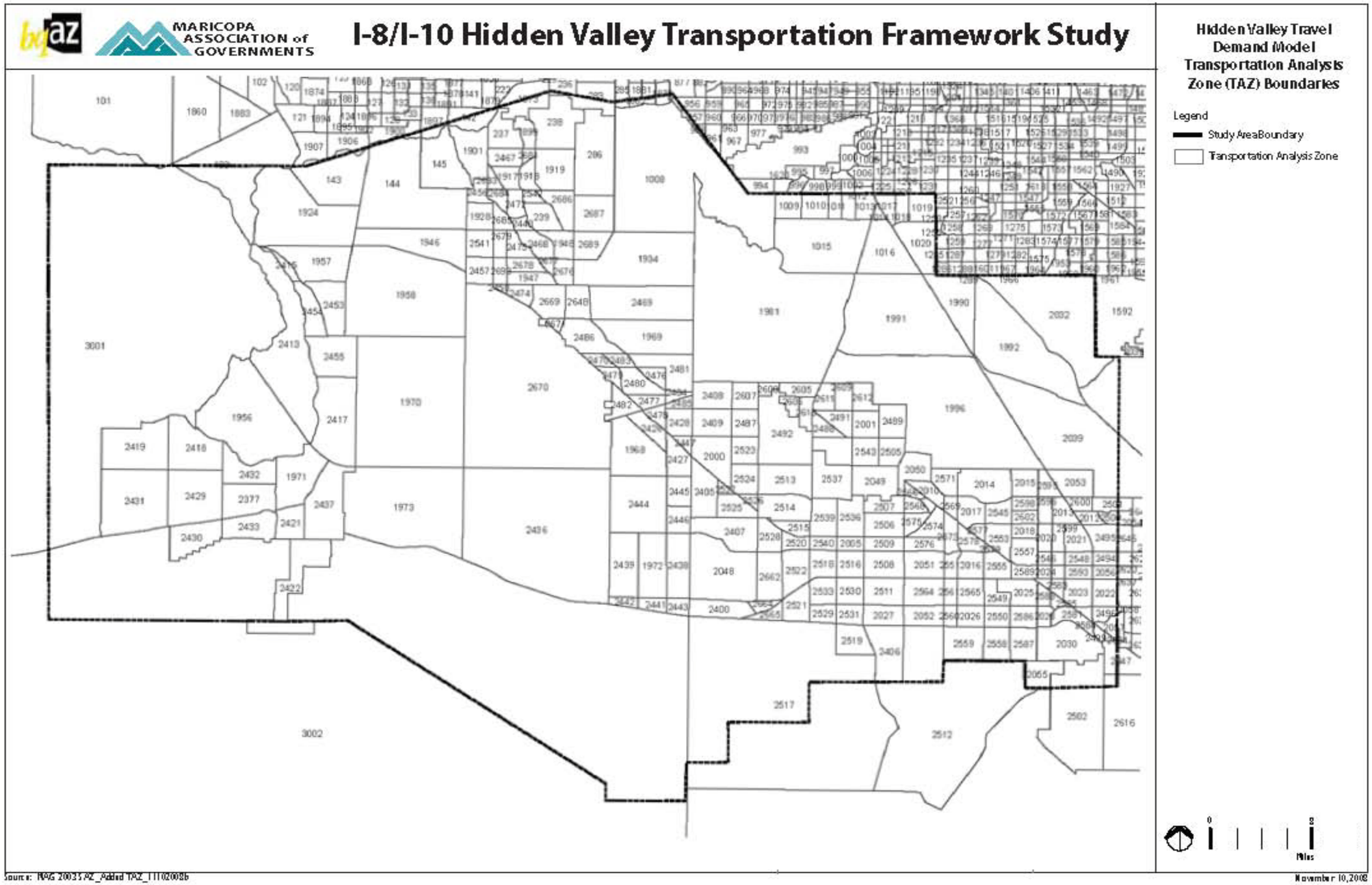
Figure 4-3 Application Schematic: Hidden Valley Travel Demand Model Trip Table



Ultimate Hidden Valley Travel Demand Model

Through the enhancements described in the previous sections, a refined travel forecasting tool was established for the Hidden Valley Study area. The ultimate Hidden Valley model incorporated additional TAZs to create a two-mile arterial grid structure. A two-mile grid (consistent with the RSRSM network) was considered sufficiently sensitive to adopted plans and the urbanization process occurring in some communities, without imposing excessive detail on the regional model framework. As travel demand in Maricopa and Pinal counties is expected to be heavily influenced by interactions between the two counties, integration of the RSRSM transportation network and socioeconomic data components and finer definition of TAZs were essential for successful travel forecasting. Figure 4-4 shows the TAZ boundaries ultimately defined and incorporated in the refined Hidden Valley model.

Figure 4-4 Hidden Valley Transportation Analysis Zone (TAZ) Boundaries



4.4 Socioeconomic Data

The travel demand model enhancement efforts for this study were meant to create a common socioeconomic database that integrates the Pinal County and MAG regional models. The integrated socioeconomic data and transportation networks permitted MAG to develop travel forecasts for the two-county study area. Having achieved consistency with the socioeconomic database, the travel forecasting focused on changes to the roadway network, with the goal of identifying the best-performing improvement alternative. Participating jurisdictions agreed to maintain a constant land use dataset, which reduced the complexity of the study and allowed the MAG team to focus on development and evaluation of the roadway network alternatives.

4.4.1 Maricopa County/MAG Data Sources and Use

The MAG Population Technical Advisory Committee recently completed an independent update of population and employment projections for the MAG planning region as part of the process to develop a new RTP. The first step in this update involved development of new Buildout population and employment projections for Maricopa County. Buildout projections were based on an amalgamation of standard statistical projections, augmented by:

(1) Expected land development patterns and densities, as identified in local general plans and comprehensive plans;
(2) Expected socioeconomic characteristics of *approved* private development plans; and
(3) Expected socioeconomic characteristics associated with *planned or proposed* development plans.

Each supplemental source gave MAG a glimpse of the location and type of future development in Maricopa County; specifically, the density of development for all major land uses. This on-the-ground knowledge was useful in refining standard socioeconomic projections prepared through examination of trends and other methods. The MAG Buildout projection represents the best current understanding of how the region will develop in the long term, although there is no set timeframe for Buildout. As noted above, Buildout is likely to occur at least 40 to 60 years in the future.

4.4.2 Pinal County/CAAG Data Sources and Use

Pinal County developed socioeconomic data in 2006 in support of the RSRSM plan. The geographic units by which the data were aggregated, the TAZs, were smaller than the ones associated with the MAG model. However, data employed for the RSRSM modeling effort did not reflect on-the-ground information available from local planning agencies and private developers. Therefore, for the Hidden Valley study, CAAG undertook an intense effort similar to that conducted by MAG to update and refine population and employment projections. The Buildout estimate for western Pinal County was developed by examining adopted general and comprehensive plans of CAAG member jurisdictions, principally Maricopa, Casa Grande and Pinal County itself. In addition, growth and development information was obtained from Coolidge, Eloy, and (unincorporated) Arizona City, which border the study area. The result of this effort was a socioeconomic database compatible and consistent with MAG projections. Neither CAAG nor MAG is a land use planning agency; each relies on information from its members to compile data on land planning and development.

4.4.3 Summary of Socioeconomic Projections

Table 4.2 summarizes the aggregate growth projections developed for the Hidden Valley study. All data was reconciled to a base year of 2005. The magnitude of projected growth from 2030 to Buildout shows the need for a comprehensive and well-connected roadway network that incorporates principal regional roadways and arterial connections, both in and between study area communities.

Table 4.2 Summary of Hidden Valley Study Area Socioeconomic Data

Year	Population	Employment
2005	90,000	49,000
2030	448,000	224,000
Buildout	2,469,000	1,096,000

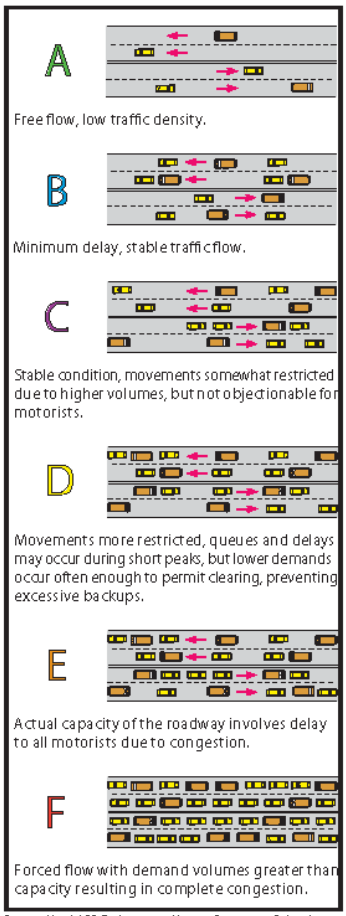
Sources: HiddenValley_P07_2030_BO.txt Socioeconomic Projections data file using TAZIO3 TAZ system, MAG, 9/14/2007. Buildout for Maricopa County based on MAG Future Land Use, June 2007. Buildout for Pinal County from CAAG, August 2007.

4.5 Methods for Evaluating Roadway Networks

4.5.1 Level of Service Concept

Level of service (LOS) is a concept commonly used by planners and engineers to describe the operational effectiveness of segments within a roadway network. LOS qualitatively characterizes perceived conditions associated with varying levels of traffic (Figure 4-5). These levels range from LOS A, which indicates free-flow traffic conditions with little or no delay experienced by motorists, to LOS F, which describes extremely congested conditions with traffic flows exceeding design capacity, resulting in long queues and delays. LOS F conditions are considered unacceptable.

Figure 4-5
Highway Levels of Service



Source: North I-25 Environmental Impact Statement, Colorado Department of Transportation/Federal Transit Administration/Federal Highway Administration, August 17,2008.

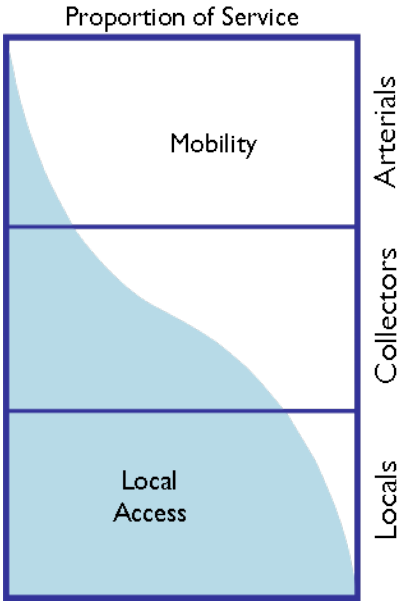
LOS A, B, and C are considered satisfactory service levels in all environments. The influence of congestion on traffic flow becomes noticeable at LOS D. In this study, the upper limit of LOS D was selected as the deficiency threshold at Buildout for the Hidden Valley study. Roadway segments with an LOS of E or F are considered deficient, indicating a need for additional capacity. This framework study strives to define ultimate (Buildout) and interim (2030) roadway systems that would operate at LOS D or better.

4.5.2 Functional Classification

Roadway design capacity directly affects LOS. More efficient designs that reduce potential traffic conflicts, minimize friction, and maintain traffic flow yield higher capacities per lane. Functional classification categorizes roads by how they trade off access with mobility. A freeway, for example, provides mobility for long-distance trips, with high speeds and no direct access to adjoining properties. Conversely, the function of a local neighborhood street is to provide direct access to neighborhoods at low speeds. Figure 4-6 presents a schematic interpretation of how mobility and access define functional classification.

Functional classification schemes vary among study area jurisdictions and are documented in Chapter 3. The Hidden Valley study team has developed a uniform functional classification system and LOS thresholds for the roadway types in Table 4.3.

Figure 4-6
Relationship of Mobility and Land Access to Functional Classification



Source: Safety Effectiveness of Highway Design Features, Volume 1, Access Control, Federal Highway Administration, 1992.

The values in Table 4.3 represent the average daily volumes that each class of roadway can accommodate at a given LOS. Figure 4-7 graphically depicts per-lane capacity differences between four- and six-lane arterials, and between six- and eight-lane parkways. Roadway design is an important aspect of the access/mobility trade-off that must be considered in developing a regional network.

4.5.3 Model-Generated System Performance Measures

The study team identified five measures to assess the performance (with respect to mobility and meeting travel demand) of networks analyzed with the Hidden Valley model. These performance measures permitted the study team to compare the effectiveness of alternative networks. Table 4.4 identifies the five measures and the units of effectiveness selected for measurement. The results of the performance assessment are included in the evaluation of network alternatives in Chapter 5.

Table 4.3 Generalized Maximum Daily Traffic Volume Thresholds by Level of Service

Functional Classification[1]	Number of Through Lanes	Level of Service (Upper volume limit of each LOS range)				
		A	B	C	D[2]	E[2]
Freeway[3]	6	43,200	70,000	101,300	131,200	**149,100**
	8	58,900	95,500	138,100	178,900	**203,200**
	10	74,700	120,900	175,100	226,400	**257,500**
	12	90,400	146,400	211,900	274,100	**311,500**
Expressway	4	25,900	41,900	60,500	78,300	**88,900**
	6	38,700	62,700	90,700	117,500	**133,500**
Arizona Parkway	6	26,100	42,300	61,200	79,200	**90,000**
	8	34,800	56,400	81,600	105,600	**120,000**
Principal Arterial	4	--[4]	5,200	32,900	41,500	**43,600**
	6	--	8,300	51,100	62,400	**65,600**
Minor Arterial	4	--	5,200	32,900	41,500	**43,600**
Collector	2	--	--	6,000	12,700	**16,000**

Notes:

[1]Freeway/Expressway/Arizona Parkway: Designed to move high volumes of traffic quickly over long distances.
Principal Arterial: Traffic movements with trip lengths and density suitable for substantial statewide and regional travel.
Minor Arterial: Connects with principal arterials; facilitates trips of moderate length; provides connections between communities.
Collector: Supports traffic movements providing both land access and traffic circulation between major generators and routes of higher classification.

[2]**Bold Type** indicates the maximum daily volume by roadway type at LOS E. This study, however, uses LOS D as the planning level threshold standard. Thus, the goal of the analysis is to identify and mitigate roadway performance of LOS E or worse.

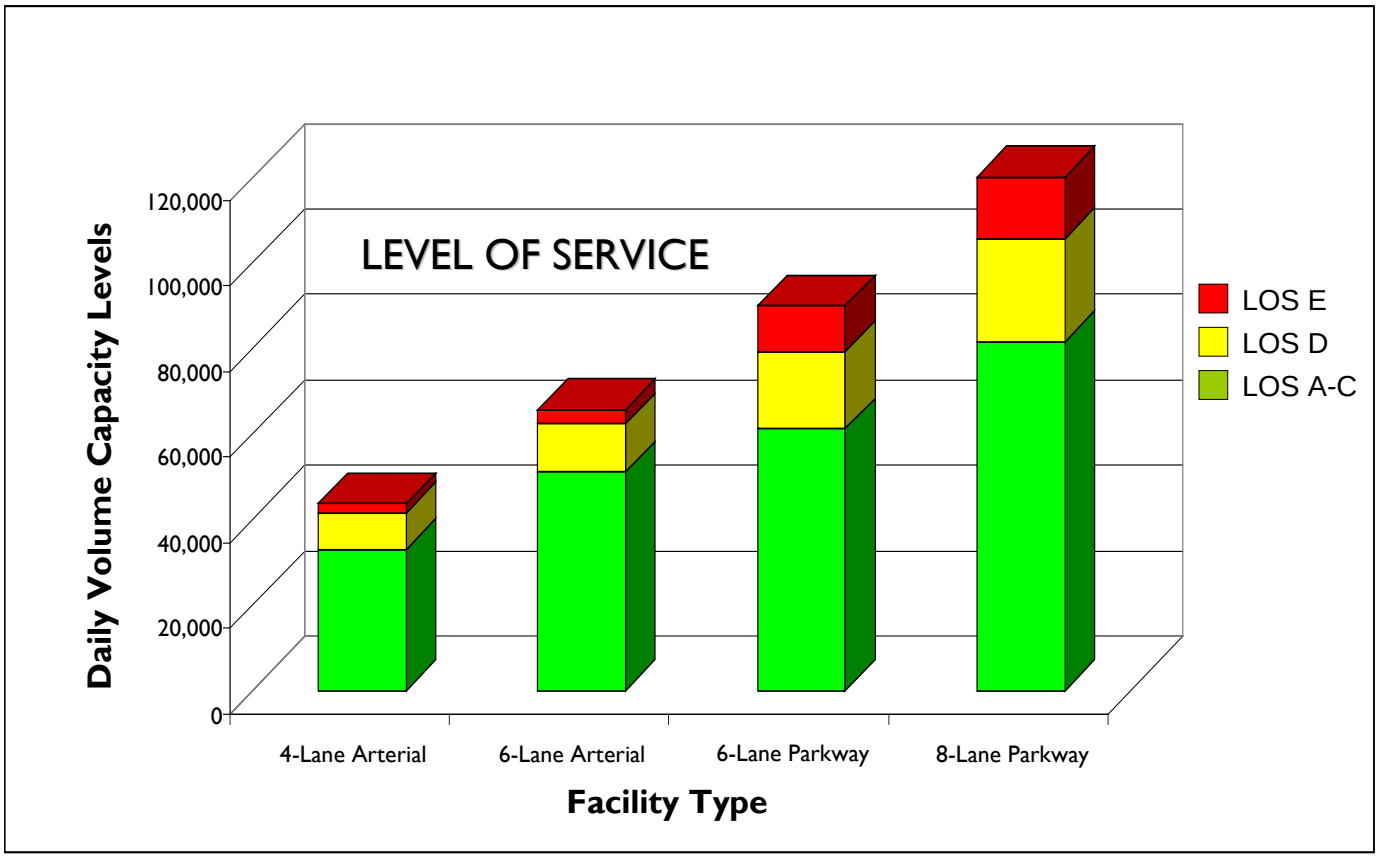
[3]Excludes auxiliary lanes. Interchange spacing less than two miles.

[4]Cannot be achieved using table input default values.

Note: This table was developed for general planning applications only; the values shown do not constitute a standard. The computer models from which this table was derived should be used for more specific planning applications. The table and computer models should not be used for corridor design, where more refined techniques exist. Values shown are for two-way annual average daily traffic (ADT) volumes based on K100 factors (100th highest volume of the year) for levels of service shown, and they apply to both automobile and truck modes. Calculations are based on planning applications of the *Highway Capacity Manual* (HCM) published by the Transportation Research Board (TRB), Washington DC, 2000.

Source: Table 4.1 (Urbanized Areas), Quality/Level of Service Handbook, Florida Department of Transportation (FDOT), 2002. Modifications were made to reflect a lower 'K' factor (0.075) that is predominant in the Phoenix metropolitan area. Original table from the I-10/Hassayampa Roadway Framework Study was modified to add the "Arizona Parkway" with capacity estimates based on MCDOT Enhanced Parkway Study prepared by Morrison-Maierle, Inc., August, 2007. Table developed by MAG and Wilson & Company (October 20, 2007).

Figure 4-7 Level of Service for Arterials and Parkways



Source: Study Review Presentation, Funding Partners Meeting, I-8 and I-10/Hidden Valley Transportation Framework Study, bqaz and Maricopa Association of Governments, June 2, 2008.

Table 4.4 Network Performance Measures

Performance Measure*	Ranking/Evaluation
Vehicle Miles of Travel (VMT) per lane mile	Minimize
Freeway VMT as percent of total network VMT	Maximize
Freeway lane miles operating at LOS E or worse as percent of total freeway lane miles	Minimize
Lane miles operating at LOS E or worse as percent of total network lane miles	Minimize
VMT at LOS E or worse as percent of total VMT	Minimize

*All measures are based on total average daily travel.

Source: Maricopa Association of Governments and Wilson & Company.

4.5.4 Cut-Line Analyses

Cut-line analysis is a technique that facilitates a broad assessment of the relationship of network capacity to travel demand. In cut-line analysis, an imaginary line is drawn across all of the major roadways—either north/south or east/west--in a selected area of the network. A total cut-line volume is obtained by adding up all the volumes on the individual roadways that cross the cut-line. Volumes on specific roadways may be higher or lower, depending on variation in the model assignment process. Thus, the cut-line volume represents the total two-way demand for travel over a broad portion of the network.

The capacity threshold of a link in the network (roadway segment) is determined by the number of lanes and the functional classification of the roadway. Therefore, each roadway intersecting a given cut-line was reviewed to determine the average daily traffic capacity associated with its functional classification at LOS E. The LOS E capacities of the roadway segments were summed to arrive at a total design capacity, which was then assigned to the intersecting cut-line. This total capacity was compared to the forecast total average daily traffic volume crossing the cut-line, as calculated from the traffic assignments of the travel demand model. This comparison yields a volume-to-capacity (V/C) ratio, i.e., the total average daily traffic volume on all intersected roadway segments divided by the expected total design capacity of those segments.

The cut-line analysis and resulting V/C ratios provide a basis for assessing the adequacy of network capacity to meet forecast travel demand. Cut-lines with a projected V/C value of at least 0.9–the boundary between levels of service D and E--represent locations with insufficient network capacity, and corridors that are expected to need additional or expanded roadways to accommodate forecast demand. The V/C ratios provide the keys to understanding the potential transportation impact of nearly 2.5 million additional residents (compared with 2005) in the study area at Buildout.

4.5.5 Corridor-Level Performance Review

The cut-line analysis provides a broad assessment of the performance of a roadway network. A corridor-level performance review allowed the team to examine the performance of individual roadway segments considered important, and led to a refinement of the final set of network alternatives. The following information was derived for each key segment from the model outputs:

- Length
- Total daily VMT
- Number of lanes
- Functional classification
- Average daily traffic
- Highest forecast volume along the segment
- Lowest forecast volume along the segment
- Capacity per lane
- Total roadway capacity
- Average V/C ratio
- Highest V/C ratio

4.6 Transportation Framework Plan Development and Evaluation

4.6.1 Step 1: Develop and Evaluate an Initial Network

Structure of MAG/CAAG Model

Step 1 involved analysis of an initial roadway network for Pinal County that had been developed for use with the MAG regional model. The model run using this two-county "Existing plus Committed" network relied on Buildout socioeconomic data and assumed no new major roads in the study area beyond other than programmed and funded projects. Thus, the initial Hidden Valley model network incorporated only a rudimentary roadway network in Pinal County that CAAG developed for regional planning purposes. The basic network elements of Pinal County, when added to the MAG RTP network (Figure 4-8), permitted the MAG study team to assess potential impacts of travel demand associated with communities in Pinal County.

Initial Model Run

The initial model network provides minimal connectivity within the study area, and between the study area and the Phoenix metropolitan area. Travel forecasts for the initial model run were constrained by the capacity of roadways forming the Existing plus Committed network. That is, the travel forecast resulting from the model run was predicated on the desired direction of travel, availability of a roadway link, and capacity limitations of the link. The functional classification of each link defined its number of lanes, and therefore, its capacity. The resulting analysis was instrumental in initial identification of future deficiencies and informed the development of improvement alternatives.

Figure 4-8 reveals the scarcity of network linkages forming the initial model network. Nevertheless, the initial network analysis was valuable in identifying where roadway capacity would be extremely deficient in certain portions of the study area relative to forecast travel demand. The initial model run generated a constrained traffic assignment to the initial model network, which was then compared to the Preliminary Conceptual Roadway Network that became Alternative A. The MAG team evaluated these initial model results by comparing forecast average daily volumes with capacity thresholds of roadway segments.

Initial Cut-Line Analysis: Forecast Traffic Volumes versus Threshold Capacity

For this preliminary analysis to identify high-capacity corridor solutions based on an order-of-magnitude evaluation, the study team determined that the LOS E thresholds from Table 4.3 (rather than LOS D as described above in 4.5.4) would be most applicable for defining necessary network capacity enhancements. The reliance of the initial modeling effort on the no-build network, which offers only a few high-capacity and arterial corridors to accommodate forecast Buildout travel demand, further supports this rationale. In the more detailed Tier 1 and Tier 2 analyses (4.6.2 and 4.6.3), the LOS D threshold is used.

Thirteen cut-lines were selected to provide a basis for evaluating travel demand relative to major corridors. Figure 4-9 shows the locations of these cut-lines, while Table 4.5 shows the key characteristics of each roadway crossing the cut-lines and the V/C values for each cut-line. Results of the initial cut-line analysis indicated that ten of the thirteen cut-lines will lack sufficient capacity to accommodate forecast traffic volumes at LOS E (a V/C ratio of less than 1.0) under Buildout conditions.

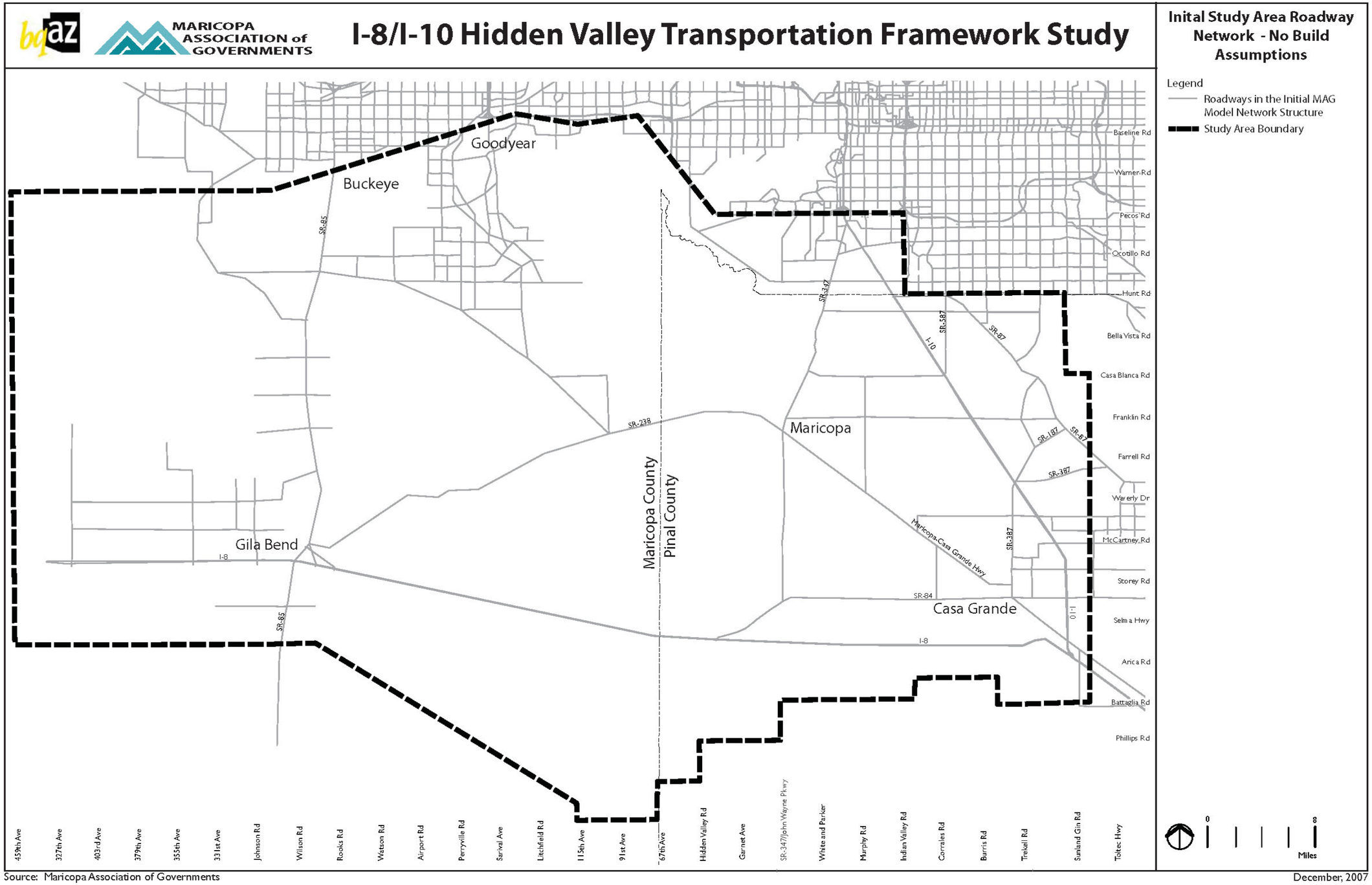
The V/C ratio of 4.99 across cut-line L indicates travel demand five times greater than planned capacity. Similarly, the model results show that travel demand across cut-line F will be 3.6 times capacity. Several other cut-lines have V/C ratios between 1.0 and 2.0. Only cut-lines A, B, and H have V/C ratios less than 1.0, and therefore demonstrate sufficient capacity to accommodate forecast Buildout traffic volumes at LOS E or better. The GRIC land east of cut-lines A and B is not expected to experience significant development. Likewise, the area west of cut-line H is dominated by the Gila River floodplain and Gila Bend Mountains, which are considered undevelopable.

Evaluate Initial Network: Identification of Potential Corridor Solutions

The initial model run provided the context for identifying new high-capacity roadway improvements. This process helped guide additions to the study area network and establish reasonable alternative travel corridors to accommodate the forecast travel demand.

Table 4.6 shows the corridor solutions proposed following the initial model run. No network solutions were identified for cut-lines A, B, and H, as travel across these cut-lines is not expected to require substantial improvements to the planned roadway system. Also, network improvements to corridors crossing cut-line M were considered very difficult to implement, because potential alignments for a high-capacity roadway will depend on further studies and approval by the GRIC (Figure 4-9).

Figure 4-8 Initial Study Area Roadway Network – Existing plus Committed



Source: Maricopa Association of Governments

December, 2007

Figure 4-9 Cut-Lines Location Map: Initial Model Network

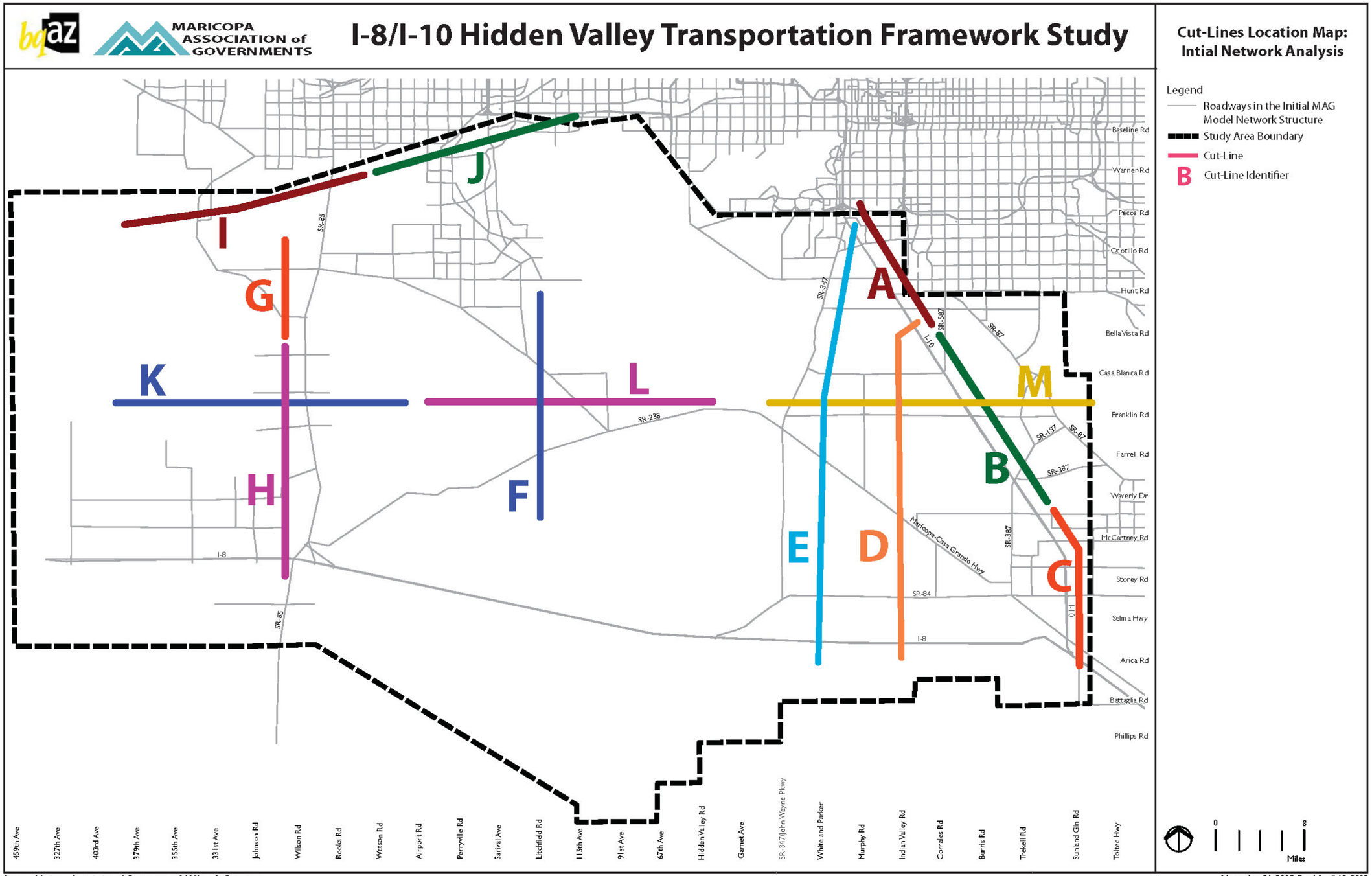


Table 4.5 Cut-Line and Volume-to-Capacity Analysis: Initial Model Results

Street Name[1]	Future Lanes (Base Condition)	Functional Class	Planning-Level Daily Volume Threshold Capacity at LOS E[2]	Buildout Daily Volume[3]	V/C Ratio
North-South Cut-lines (East-West Travel)					
Cut-Line A – East of I-10/GRIC Region North					
SR-202/Santan Freeway	10	Freeway	257,000	139,100	0.54
Maricopa Road/56th Street extension	6	Principal Arterial	65,600	70,000	1.07
Queen Creek Road	6	Principal Arterial	65,600	49,900	0.76
Chandler Heights Road	6	Principal Arterial	65,600	4,300	0.07
Riggs Road	6	Principal Arterial	65,600	74,100	1.13
Hunt Highway	6	Principal Arterial	65,600	93,500	1.43
Goodyear Road alignment	4	Minor Arterial	43,600	68,100	1.56
		Cut-Line A Total	**628,600**	**499,000**	**0.79**
Cut-Line B – East of I-10/GRIC Region South					
SR-587	6	Principal Arterial	65,600	97,200	1.48
Seed Farm Road	4	Minor Arterial	43,600	22,400	0.51
SR-187	6	Principal Arterial	65,600	46,000	0.70
SR-387	6	Principal Arterial	65,600	39,100	0.60
		Cut-Line B Total	**240,400**	**204,700**	**0.85**
Cut-Line C – East of I-10/GRIC Region South					
Val Vista Boulevard	6	Principal Arterial	65,600	171,400	2.61
McCartney Road	6	Principal Arterial	65,600	85,800	1.31
Rodeo/Randolph Road	4	Minor Arterial	43,600	--	--
Kortsen Road/Kleck Road	6	Principal Arterial	65,600	158,800	2.42
Storey Road/Clayton Road	4	Minor Arterial	43,600	--	--
SR-287/Florence Boulevard	6	Principal Arterial	65,600	194,100	2.96
Earley Road/Peters Road	4	Minor Arterial	43,600	--	--
Selma Highway	6	Principal Arterial	65,600	--	--
SR-84/Jimmie Kerr Boulevard	6	Principal Arterial	65,600	136,300	2.08
Interstate 10	10	Freeway	257,500	400,000	1.55
Houser Road	4	Minor Arterial	43,600	--	--
Battaglia Road	4	Minor Arterial	43,600	65,200	1.50
		Cut-Line C Total	**869,100**	**1,211,600**	**1.39**
Cut-Line D – West of Indian Valley Road/Casa Grande & GRIC Regions					
Interstate 10	10	Freeway	257,500	154,400	0.60
Bapchule Road/Casa Blanca Road	4	Minor Arterial	43,600	85,000	1.95
Smith-Enke Road	4	Minor Arterial	43,600	93,500	2.14
Maricopa-Casa Grande Highway	6	Principal Arterial	65,600	383,300	5.84
SR-84/Gila Bend Highway	6	Principal Arterial	65,600	255,500	3.89
Interstate 8	8	Freeway	203,200	342,500	1.69
		Cut-Line D Total	**679,100**	**1,314,200**	**1.94**
Cut-Line E – East of SR-347/Maricopa & GRIC Regions					
Interstate 10	10	Freeway	257,500	214,100	0.83
SR-347/Queen Creek Road	6	Principal Arterial	65,600	76,300	1.16
Chandler Heights Road	6	Principal Arterial	65,600	22,600	0.34
Beltline Road/Riggs Road	6	Principal Arterial	65,600	74,800	1.14
Goodyear Road alignment	4	Minor Arterial	43,600	127,900	2.93
Bapchule Road	4	Minor Arterial	43,600	56,900	1.31
Smith-Enke Road	4	Minor Arterial	43,600	57,800	1.33
Maricopa-Casa Grande Highway	6	Principal Arterial	65,600	305,400	4.66
SR-84/Gila Bend Highway	6	Principal Arterial	65,600	239,800	3.66
Interstate 8	8	Freeway	203,200	342,500	1.69
		Cut-Line E Total	**919,500**	**1,518,100**	**1.65**
Cut-Line F – West of 115th Avenue (Mobile)/Sonoran Valley Region South					
Rainbow Valley Road extension	6	Principal Arterial	65,600	302,500	4.61
Maricopa-Gila Bend Road	4	Principal Arterial	43,600	93,800	2.15
		Cut-Line F Total	**109,200**	**396,300**	**3.63**
Cut-Line G – West of SR-85 (Buckeye/Gila Bend Hwy)/Buckeye Region					
Riggs Road	6	Principal Arterial	65,600	81,200	1.24
Patterson Road	6	Principal Arterial	65,600	72,900	1.11
		Cut-Line G Total	**131,200**	**154,100**	**1.17**
Cut-Line H – West of SR-85 (Buckeye/Gila Bend Hwy)/Gila Bend Region					
Woods Road	6	Principal Arterial	65,600	55,200	0.84
Pierpoint Road	6	Principal Arterial	203,200	55,200	0.27
Fornes Road	6	Principal Arterial	65,600	17,300	0.26
Watermelon Road	6	Principal Arterial	203,200	132,200	0.65
E. Pima Street	6	Principal Arterial	65,600	111,900	1.71
Interstate 8	8	Freeway	203,200	256,300	1.26
		Cut-Line H Total	**806,400**	**628,100**	**0.78**
East-West Cut-lines (North-South Travel)					
Cut-Line I – South of Gila River/Buckeye Region					
Old US-80	4	Minor Arterial	43,600	118,200	2.71
SR-85 (Buckeye/Gila Bend Highway)	8	Freeway	203,200	174,600	0.86
Apache Road/243rd Avenue	4	Minor Arterial	43,600	80,100	1.84
		Cut-Line I Total	**290,400**	**372,900**	**1.28**
Cut-Line J – South of Gila River/Goodyear					
Airport Road	6	Principal Arterial	65,600	224,800	3.43
Tuthill Road	6	Principal Arterial	65,600	147,900	2.25
Rainbow Valley	6	Principal Arterial	65,600	97,600	1.49
SR-303L/Cotton Lane	8	Freeway	203,200	228,000	1.12
Estrella Parkway	6	Principal Arterial	65,600	203,700	3.11
		Cut-Line J Total	**465,600**	**902,00**	**1.94**
Cut-Line K – North of Smith-Enke Road Alignment/Gila Bend Region					
SR-85 (Buckeye/Gila Bend Highway)	8	Freeway	203,200	240,500	1.18
		Cut-Line K Total	**203,200**	**240,500**	**1.18**
Cut-Line L – North of Smith-Enke Road Alignment/Sonoran Valley Region North					
Rainbow Valley Road Extension	6	Principal Arterial	65,600	327,200	4.99
		Cut-Line L Total	**65,600**	**327,200**	**4.99**
Cut-Line M – North of Smith-Enke Road Alignment/Maricopa & Casa Grande Regions					
SR-347	6	Principal Arterial	65,600	371,800	5.67
N. Murphy Road alignment	4	Minor Arterial	43,600	113,200	2.60
Interstate 10	10	Freeway	257,500	449,700	1.75
Voak Road	4	Minor Arterial	43,600	29,300	0.67
SR-87	6	Principal Arterial	65,600	27,500	0.42
		Cut-Line M Total	**475,900**	**991,500**	**2.08**

[1]Any capacity Improvements crossing Indian Communities are contingent upon further studies and community approval.
[2]Table 4-1 (Urbanized Areas), Quality/Level of service Handbook, Florida Department of Transportation (FDOT), 2002. Values shown are for two-way annual daily volumes (ADT) based on K_{100} factors (100th highest volume of the year) for levels of service shown, and they apply to both automobile and truck modes. Calculations are based on planning applications identified in the Highway Capacity manual (HCM) published by the Transportation Research Board (TRB), Washington DC, 2000. Modifications were made to reflect a lower "K" factor (0.075 vs. 0.095) that is predominant in the Phoenix metropolitan area. Table developed by Maricopa Association of Governments (MAG) and Wilson & Company (December 10, 2007).
[3]MAG 2050 Buildout ADT Volume Forecast (base Condition – Adopted RTP network), dated December 7, 2007.

Table 4.6 Candidate High-Capacity Corridor Solutions for Network Capacity Deficiencies

	Cut-Line Performance Summary				Planning Parameters					High-Capacity Corridor Enhancements			Result of Implementing Capacity Enhancements		
							Daily Planning-Level Threshold								
Cut-line ID	Capacity of Existing + Committed Facilities	Forecast Buildout Daily Volume	V/C Ratio	Volume in Excess of Capacity	Future Facility Type	No. of Lanes	Annual Average Daily Volume	Volume per Lane (LOS E)	No. of Future Lanes Required[1]	Candidate High-Capacity Corridor Improvement	New/Added Lanes (total = 140)	Total New/Added Corridor Capacity	Adjusted Corridor Capacity	Total Lane Deficiency	Estimated Resultant V/C
A	628,600	499,000	0.79	0	Not applicable	Not applicable	Not applicable	Not applicable	0	Not applicable	0	0	628,600	Not Applicable	0.79
B	240,400	204,700	0.85	0	Not applicable	Not applicable	Not applicable	Not applicable	0	Not applicable	0	0	240,400	Not Applicable	0.85
C	869,100	1,211,600	1.39	342,500	Freeway	10	257,500	25,750	13	Add East-West Hassayampa Freeway (10 new lanes)	10	257,500	1,126,600	3	1.08
D	679,100	1,314,200	1.94	635,100	Freeway	10	257,500	25,750	25	Add East-West Hassayampa Freeway (10 new lanes)	10	617,500	1,296,600	1	1.01
					Parkway	8	120,000	15,000	43	Add 3 New East-West Parkways, Val Vista Pkwy, SR-84 Pkwy & Arica Pkwy (24 new lanes)	24				
E	915,500	1,518,100	1.66	602,600	Freeway	10	257,500	25,750	24	Add East-West Hassayampa Freeway (10 new lanes)	10	617,500	1,533,000	0 or Less	0.99
					Parkway	8	120,000	15,000	41	Add 3 New East-West Parkways, Val Vista Pkwy & SR-84 Pkwy & Arica Pkwy (24 new lanes)	24				
F	109,200	396,300	3.63	287,100	Freeway	10	257,500	25,750	12	Add East-West Hassayampa Freeway (10 new lanes)	10	347,500	456,700	0 or Less	0.87
					Parkway	6	90,000	15,000	20	Add East-West Sonoran Valley Parkway (6 new lanes)	6				
G	131,200	154,100	1.17	22,900	Freeway	10	257,500	27,750	1	Add East-West Hassayampa Freeway (10 new lanes)	10	257,500	388,700	0 or Less	0.40
H	806,400	628,100	0.78	0	Not applicable	Not applicable	Not applicable	Not applicable	0	Not applicable	0	0	806,400	Not Applicable	0.78
I	290,400	372,900	1.28	82,500	Freeway	10	257,500	25,750	4	Add North-South Hassayampa Freeway (10 new lanes)	10	257,500	547,900	0 or Less	0.68
J	465,600	902,000	1.94	436,400	Freeway	10	257,500	25,750	17	Widen SR-303L Freeway (2 new lanes)	2	171,500	637,100	10	1.42
					Parkway	8	120,000	15,000	30	Add Cotton Lane river crossing (8 new lanes)	8			18	
K	203,200	240,500	1.18	37,300	Parkway	6	90,000	15,000	3	Add Hidden Waters Parkway (6 new lanes)	6	90.000	293,200	0 or Less	0.82
L	65,600	327,200	4.99	261,600	Freeway	10	257,500	25,750	11	Add North-South Hassayampa Freeway (10 new lanes)	10	257,500	323,100	0 or Less	1.01
M	475,900	991,500	2.08	515,600	Freeway	10	257,500	25,800	20	Capacity enhancements in this region would be contingent on further studies and approval by the Gila River Indian Community	0	0	475,900	Not Applicable	2.08
					Parkway	8	120,000	15,000	35		0			Not Applicable	

[1]For the column labeled "No. of Future Lanes Required," the reference to freeway and parkway lanes for cut-lines D, E, F, J, and M indicates that either freeway or parkway lanes, or a combination of both, could be added to meet the predicted level of travel demand. However, values shown indicate the number of lanes required, if one or the other facility type is constructed.

Source: Initial, unconstrained travel demand traffic assignment based on adopted MAG RTP Network.

The cut-line analyses revealed where additional high-capacity travel lanes (freeway and parkway) will be required to accommodate forecast travel demand at Buildout. The analysis revealed whether freeway or parkway lanes could be added and how many of each. Disregarding cut-lines A, B, H, and M, opportunities were defined for enhancing the base roadway network by adding to or creating new high-capacity roadways across the cut-lines. As Table 4.6 shows, 140 new freeway and parkway travel lanes can be added to the roadway network to alleviate capacity problems. These new travel lanes will increase network capacity and improve V/C ratios for each of the subject cut-lines. Significant improvement will be attained across cut-lines F and L. Nevertheless, Table 4.6 indicates that still more new high-capacity travel lanes will be needed in corridors crossing cut-lines C, D, and J to eliminate all of the capacity problems. Capacity improvements relative to cut-line C would involve adding new freeway lanes; capacity improvements for cut-lines D and J might include additional freeway lanes, parkway lanes, or both.

This evaluation provided the foundation for subsequent detailed analysis of network alternatives and identification of the magnitude of new lane-miles of capacity required in the Hidden Valley study area, as presented in subsequent sections.

4.6.2 Step 2: Define and Evaluate Future Network Alternatives – Tier 1

The initial planning-level evaluation in Step 1 was crucial to understanding "order of magnitude" transportation infrastructure needs. The next phase involved refinement of the roadway network and minor changes to the model structure. This second step focused on defining and testing a set of roadway network alternatives, referred to as Tier 1 alternatives. Each alternative was defined to achieve certain objectives while meeting transportation needs under Buildout conditions.

The results of Step 1 show that forecast traffic volumes associated with Buildout of the Hidden Valley will greatly exceed the capacity of major roadways in the initial network. The MAG and CAAG Existing plus Committed network will not provide sufficient capacity counties to support anticipated travel demand. One drawback of the initial modeling approach was that the sizes of the TAZs used for forecasting travel demand, especially in Pinal County, were too large to reliably predict directional travel and roadway loadings.

The Preliminary Conceptual Roadway Network was conceived to serve as a reasonable guide for identifying circulation improvements and providing additional capacity. This network incorporates freeway, parkway and arterial corridors configured to accommodate projected growth and development under Buildout conditions. Development of the plan relied on understanding of traffic flows and patterns associated with general and comprehensive plans, master-planned communities, and known development plans. In addition, TAZs in Pinal County were redefined to improve the model's forecasting ability.

Following definition of the Preliminary Conceptual Network, the MAG team and stakeholders developed a set of alternative roadway networks. MAG conducted model runs to evaluate the performance of each. The travel demand modeling aided evaluation of the performance of alternatives and, ultimately, selection of a recommended alternative. Chapter 5 describes and maps the seven Tier 1 roadway network alternatives that emerged from this process: A, A1, B, C, C1, C2 and C3. To summarize, these alternative were labeled as follows:

- Alternative A – Balanced Capacity
- Alternative A1: Balanced Capacity (with added capacity in Sonoran Valley)
- Alternative B – Maximum Mobility (i.e., more facilities designated as freeways at Buildout)
  Alternative C – Minimum Impact (reducing the classification and capacity of selected roads from Alternative A)
- Alternative C1: Minimum Impact (redesignating selected major arterials as parkways
- Alternative C2: Minimum Impact (retaining Hassayampa Freeway through to I-10)
- Alternative C3: Minimum Impact (redesignating SR-303L Extension as a Freeway)

The third full round of model runs, using the initial model structure, produced data on operational characteristics of these seven networks at Buildout, from which measures of effectiveness were generated. Table 4.7 summarizes the characteristics of each alternative by roadway functional classification. Alternative B provides the most freeway lane miles and the second most parkway lane miles, while minimizing lane miles of arterial roadways. Thus, this alternative best meets the objective of creating a high-capacity (freeway and parkway) network for the study area. Alternative C has the most arterial lane miles, reflecting a network that focuses more on localized and subregional movement and less on high-capacity regional thoroughfares.

As in the initial evaluation, the cut-line analysis method was applied to model results for the seven alternatives. Figure 4-10 shows the locations of the thirteen cut-lines with respect to the expanded roadway network from which the seven alternatives were refined. Table 4.8 presents the results of the cut-line analysis and identifies cut-lines whose crossing roadways are forecast to operate at LOS E or worse.

Results of the cut-line analysis (Table 4.8) show that ten of the thirteen cut-lines will have serious capacity problems with the Existing plus Committed Roadway Network, and another will be associated with less severe congestion. This skeletal network, lacking major high-capacity roadways, will be incapable of supporting the forecast traffic levels associated with Buildout conditions. It performs relatively well only with respect to cut-lines A and G. These cut-lines measure travel in minimal existing development and little expected future development, owing to the presence of the GRIC (Cut-line A) and the Gila River valley as well as other topographic features (Cut-line G).

Table 4.7 Tier I Alternatives

Network Lane Miles by Alternative								
Functional Classification	Existing + Committed Roadway Network	Balanced Capacity		Maximum Mobility	Minimum Impact			
		A	A1	B	C	C1	C2	C3
Freeway	562	1,910	1,910	2,150	1,588	1,588	1,838	1,667
Parkway	273	1,466	1,278	1,359	854	818	568	739
Major Arterials	2,492	2,034	2,078	1,968	2,901	2,860	2,860	2,860
Total	3,327	5,410	5,266	5,477	5,344	5,265	5,266	5,266

Source: MAG Hidden Valley travel demand model.

Figure 4-10 Revised Cut-Lines for Analysis of Tier 1 and Tier 2 Alternatives

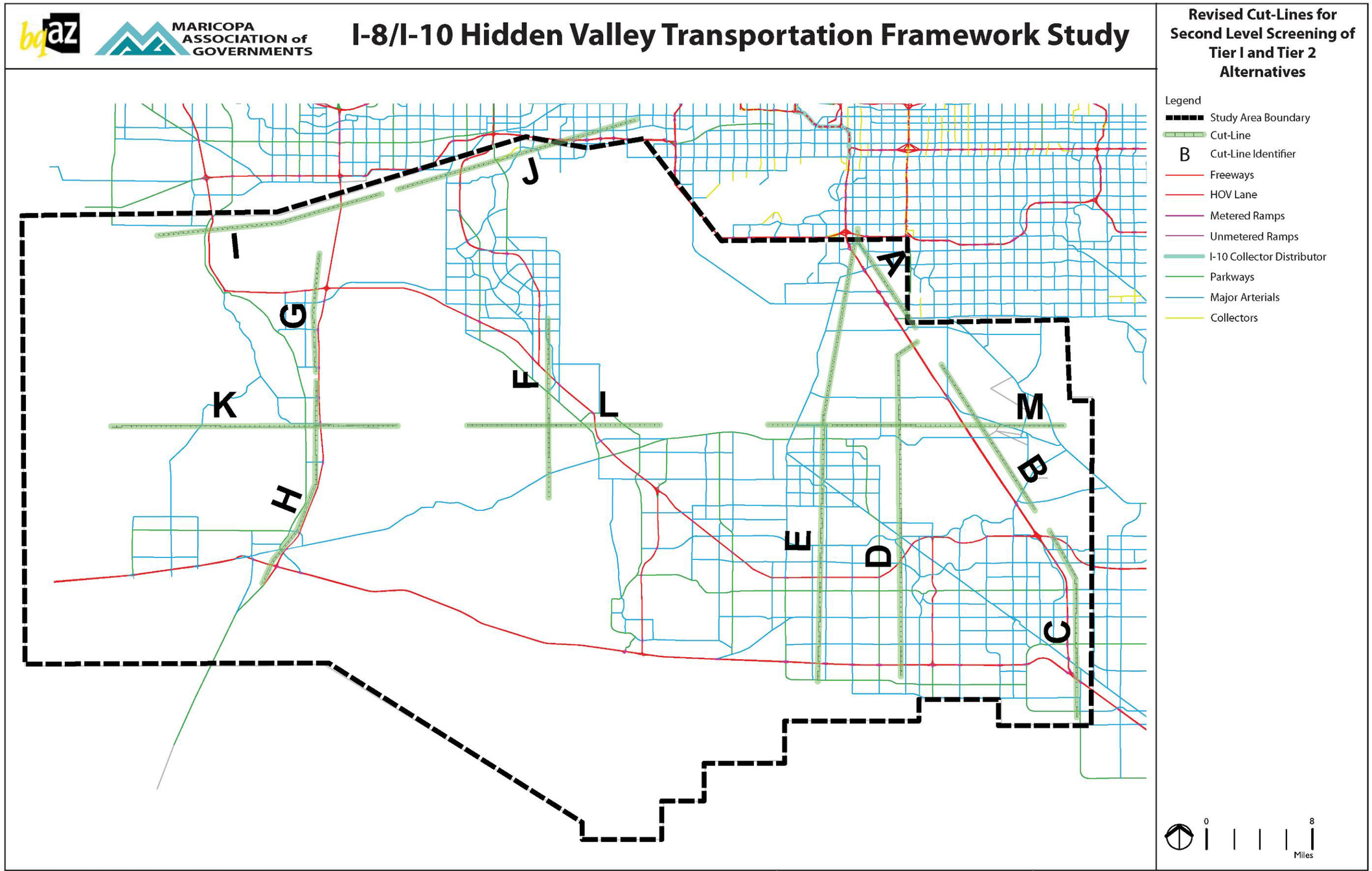


Table 4.8 Cut-Line Volume-to-Capacity Ratios: Tier 1 Alternatives

North-South Cut-Lines (East-West Travel)								
Cut-Line	**Existing plus Committed Roadway Network**	**A**	**A1**	**B**	**C**	**C1**	**C2**	**C3**
A	0.55	0.41	0.40	0.41	0.42	0.40	0.40	0.41
Rank	8	4	1	4	7	1	1	4
B	**0.90**	0.41	0.42	0.41	0.44	0.43	0.42	0.43
Rank	7	1	3	1	6	5	3	5
C	**1.72**	0.64	0.64	0.64	0.66	0.63	0.64	0.63
Rank	8	3	3	3	7	1	3	1
D	**3.01**	**1.13**	**1.13**	**1.11**	**1.26**	**1.27**	**1.19**	**1.26**
Rank	7	2	2	1	5	8	4	5
E	**2.58**	**1.15**	**1.16**	**0.95**	**1.28**	**1.28**	**1.25**	**1.28**
Rank	8	2	3	1	5	5	4	5
F	**3.20**	0.56	0.55	0.58	0.58	0.60	0.59	0.62
Rank	8	2	1	3	3	6	5	7
G	0.73	0.45	0.46	0.47	0.42	0.47	0.48	0.50
Rank	8	2	3	4	1	4	6	7
H	**0.99**	**1.02**	**0.99**	**1.03**	**1.01**	**1.09**	**1.08**	**1.08**
Rank	1	4	1	5	3	8	6	6
Cumulative Total*	**1.80**	0.85	0.85	0.79	0.89	**0.90**	0.89	**0.90**
Overall Rank	8	2	2	1	4	6	4	6
East-West Cut-Lines (North-South Travel)								
Cut-Line	**Existing plus Committed**	**A**	**A1**	**B**	**C**	**C1**	**C2**	**C3**
I	**0.95**	0.59	0.58	0.59	0.59	0.61	0.62	0.62
Rank	8	2	1	2	2	5	6	6
J	**1.51**	0.68	**0.92**	0.69	0.69	**0.96**	**0.93**	**0.97**
Rank	8	1	4	2	2	6	5	7
K	**2.52**	**0.95**	**0.95**	**0.95**	**1.05**	**1.09**	**1.05**	**1.04**
Rank	8	1	1	1	5	7	5	4
L	**2.77**	0.78	0.76	0.81	0.78	0.82	0.81	0.86
Rank	8	2	1	4	2	6	4	7
M	**2.33**	**1.16**	**1.17**	**1.11**	**1.19**	**1.17**	**1.18**	**1.15**
Rank	7	3	4	1	8	4	6	2
Cumulative Total*	**1.80**	0.77	0.86	0.78	0.79	**0.90**	0.89	**0.91**
Overall Rank	8	1	4	2	3	6	5	7
All Network Cut-Lines								
Summary	**Existing plus Committed**	**A**	**A1**	**B**	**C**	**C1**	**C2**	**C3**
Number of roadways crossing cut-lines at LOS E or worse	48	16	19	12	21	24	22	23
Rank	8	2	3	1	4	7	5	6

:
Bold indicates that the cumulative traffic volume on all roadways crossing the cut-line is operating at LOS E or worse (V/C of 0.90 or more), as determined by each roadway's functional classification and number of lanes. A value of 1.00 or more denotes LOS F.
Bold cell outlining indicates the best-performing alternative.
*Based on total traffic volume crossing the cut-line compared to total available capacity.

Source: MAG Hidden Valley Travel Demand Model.

Forecast traffic levels across five of the cut-lines – D, E, H, K, and M – reveal that the roadway network identified with all or some of the alternatives will be insufficient to accommodate forecast traffic volumes associated with Buildout conditions. East-west roadways in the Gila Bend area that cross cut-line H, which runs along the west side of SR-85, will be marginally over capacity. Roadways crossing cut-lines D and E, which capture east-west travel through the communities of Maricopa and Casa Grande, will be even less capable of accommodating forecast travel demand. North-south travel in the SR-85 corridor (cut-line K) will be a problem under alternatives C, C1, C2 and C3. Roadways crossing cut-line M, which provides the principal measure of travel between the eastern portion of the study area and the Phoenix metropolitan area, will be over capacity under every alternative.

Table 4.8 shows that Alternative B, the Maximum Mobility scenario with substantial additional freeway capacity in Maricopa and Casa Grande, has the fewest roadways (twelve) crossing cut-lines at LOS E or worse. The next best alternative is A, with A1 ranking third.

4.6.3 Step 3: Define and Evaluate Future Network Alternatives – Tier 2

The evaluation of Tier 1 alternatives revealed the initial model structure as incapable of fully accounting for travel on the future local arterial system, as this component of the ultimate roadway network was not completely reflected in the initial or refined travel demand model. The study team, with input from the SRT, also determined that the TAZ structure of the initial and refined model networks was incapable of resolving travel demand at a level necessary to assess Buildout conditions in localized and subregional areas; specifically, the urbanizing communities of Maricopa, Casa Grande, and Eloy. The conclusion was that there were an insufficient number of TAZs and links (roadway segments) in the network, and that some TAZs were too large.

Therefore, the model framework was enhanced to include a finer TAZ structure and additional local arterial linkages to reflect travel exchanges within and between Maricopa and Pinal counties. That is to say, additional TAZs were identified and incorporated into the model to better predict the magnitude and spatial distribution of trips under Buildout socioeconomic conditions. This enhanced TAZ structure made the model more sensitive to future population and employment dynamics in the study area, particularly in western Pinal County. This process gave MAG the ability to generate a revised daily traffic assignment under Buildout conditions for the enhanced roadway network. The enhanced travel forecasting tool was used to generate daily traffic volumes for each Tier 2 alternative.

As described in Chapter 5, the study team identified four roadway alternatives for Tier 2 evaluation with the enhanced model: A, A1, B and C2. Table 4.9 summarizes the characteristics of the four Tier 2 alternatives by roadway functional classification. Appendix A provides a set of trip assignments for the Tier 2 Alternatives.

Table 4.10 presents the results of the cut-line analysis for the Existing plus Committed Network and the Tier 2 alternatives. Most interesting is the superiority of Alternative A1 relative to the north-south cut-lines (A through H), which measure capacity in the east-west direction; except for cut-lines G and H, located west of SR-85, Alternative A1 ranks highest. The results for the east-west cut-lines reveal a different picture. Here no alternative clearly leads the field. Alternative A ranks highest overall, only slightly ahead of A1. Each Tier 2 alternative has about the same number of roadways (50 to 54) crossing cut-lines at LOS E or worse.

4.6.4 Step 4: Define Recommended Alternative

To further aid the evaluation process, the study team undertook a more detailed analysis of key roadway corridors. The objective of this exercise was to provide a focused assessment of Buildout traffic operations on segments of these corridors. The same model data and network structure was used for all network alternatives, which resulted in variations between the alternatives in the performance of individual segments. Examining these variations led to derivation of a hybrid network that would, with additional adjustments requested by stakeholders, become the recommended roadway framework for the Hidden Valley study area. Appendix B contains the tabulated results of this corridor analysis. Chapter 6 provides a detailed description of the recommended alternative.

Table 4.9 Tier 2 Alternatives

Network Lane Miles by Alternative					
Functional Classification	**Existing + Committed Roadway Network**	**A: Balanced Capacity**	**A1: Modified Balanced Capacity**	**B: Maximum Mobility**	**C2: Modified Minimum Impact**
Freeway	1,096	1,722	1,722	1,876	1,667
Parkway	329	1,414	1,507	1,347	1,563
Major Arterials	3,385	3,506	3,444	3,440	3,444
Total Lane Miles	4,809	6,642	6,673	6,663	6,674

Bold outlining indicates best-performing alternative.

Source: MAG Hidden Valley travel demand model.

Table 4.10 Cut-Line Volume-to-Capacity Ratios: Tier 2 Alternatives

North-South Cut-Lines (East-West Travel)					
Cut-Line	**Existing plus Committed**	**A: Balanced Capacity**	**A1: Modified Balanced Capacity**	**B: Maximum Mobility**	**C2: Modified Minimum Impact**
A	0.51	0.51	0.32	0.50	0.50
Rank	Base	4	1	2	2
B	**1.21**	0.63	0.26	0.55	0.64
Rank	Base	3	1	2	4
C	**1.15**	**0.91**	0.72	**0.92**	**0.90**
Rank	Base	3	1	4	2
D	**2.33**	**1.18**	0.81	**1.11**	**1.18**
Rank	Base	3	1	2	3
E	**1.67**	**1.13**	0.77	**1.06**	**1.13**
Rank	Base	3	1	2	3
F	**1.22**	0.86	0.66	0.87	0.80
Rank	Base	3	1	4	2
G	**1.94**	0.86	0.87	0.89	0.83
Rank	Base	2	3	4	1
H	**1.87**	**1.45**	**1.45**	**1.44**	**1.44**
Rank	Base	3	3	1	1
Cumulative Total*	**1.54**	**1.02**	0.74	**0.99**	**1.01**
Overall Rank	Base	4	1	2	3

Table 4.10 Continued

East-West Cut-Lines (North-South Travel)					
Cut-Line	**Existing plus Committed**	**A**	**A1**	**B**	**C2**
I	**1.73**	0.79	0.79	0.80	0.77
Rank	Base	2	2	4	1
J	**1.37**	**1.15**	**0.97**	**1.14**	**1.14**
Rank	Base	4	1	2	2
K	0.62	0.59	0.88	**1.23**	**1.23**
Rank	Base	1	2	3	3
L	**4.82**	**1.24**	**1.25**	**1.25**	**1.22**
Rank	Base	2	3	3	1
M	**1.72**	**1.24**	**1.25**	**1.23**	**1.25**
Rank	Base	2	3	1	3
Cumulative Total*	**1.37**	**1.00**	**1.03**	**1.12**	**1.11**
Overall Rank	Base	1	2	4	3
All Network Cut-Lines					
Number of roadways crossing cut-lines at LOS E or worse	74	54	54	50	53
Rank	Base	3	3	1	2

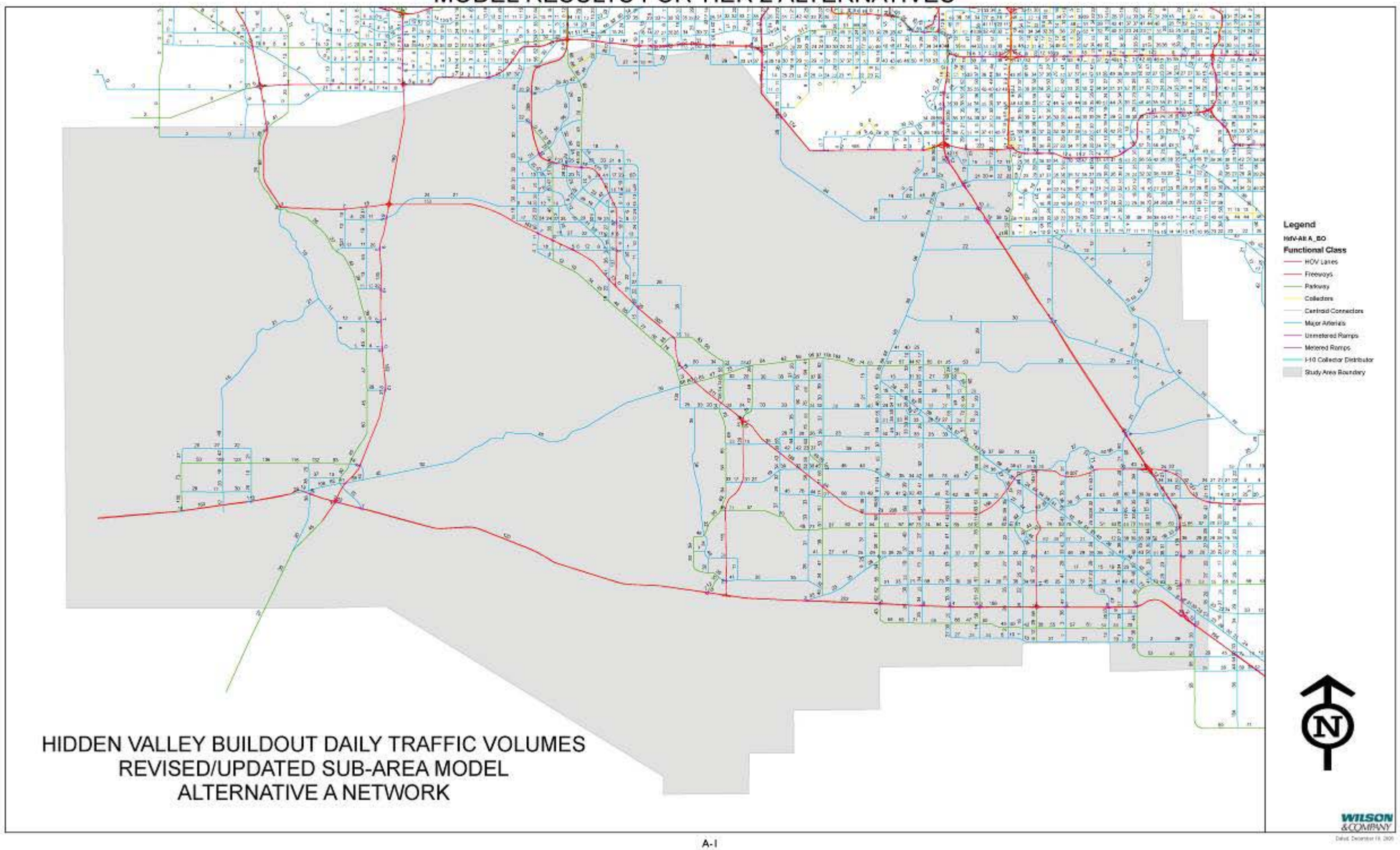
Notes:
Bold indicates that the cumulative traffic volume on all roadways crossing the cut-line is operating at LOS E or worse (V/C of 0.90 or more), as determined by each roadway's functional classification and number of lanes. A value of 1.00 or more denotes LOS F.
Bold cell outlining indicates the best-performing alternative.
*Based on total traffic volume crossing the cut-line compared to total available capacity.

Source: MAG Hidden Valley Travel Demand Model.

APPENDIX A

TRAFFIC VOLUME ASSIGNMENTS: TIER 2 ALTERNATIVES

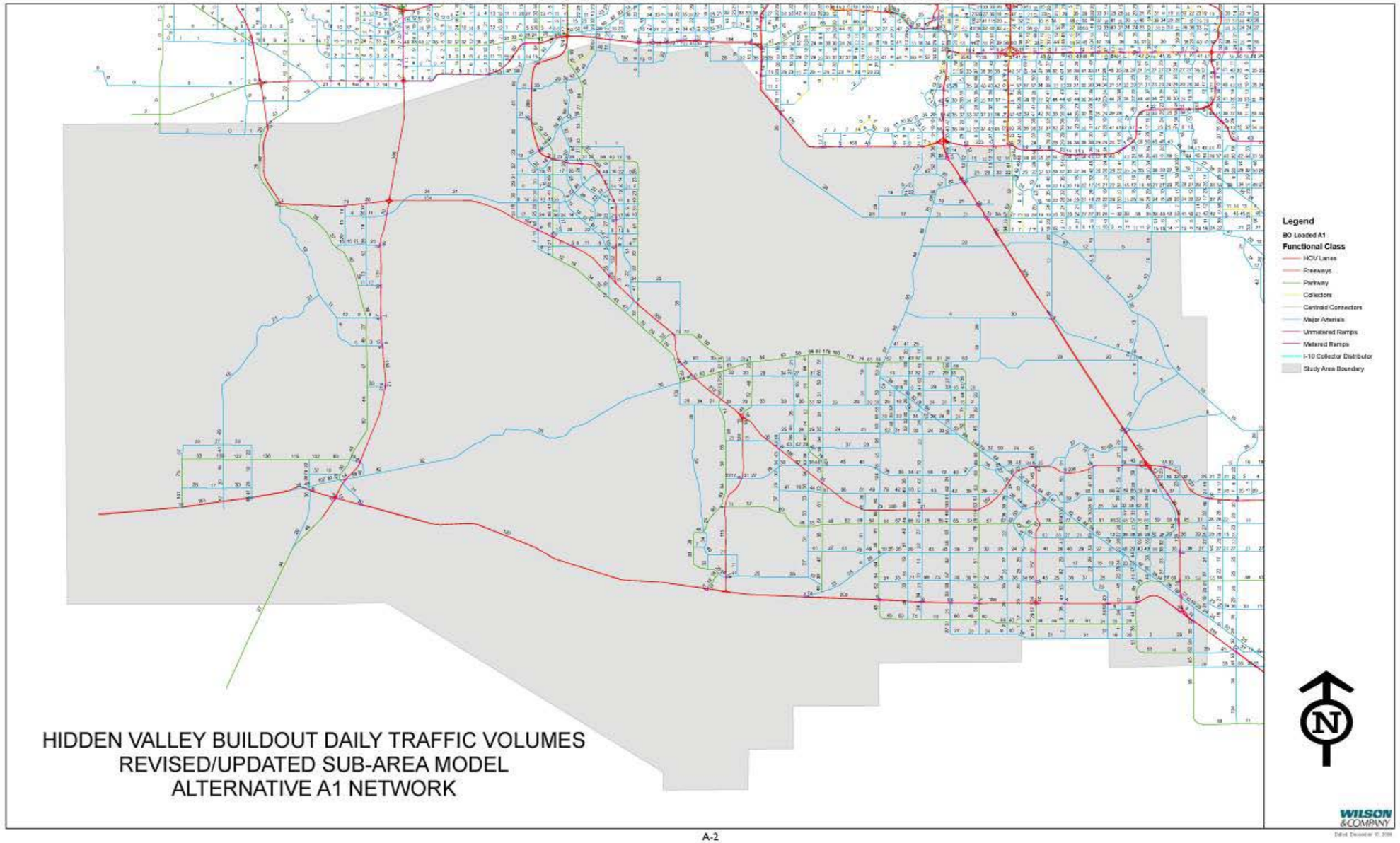
I-8/I-10 HIDDEN VALLEY TRANSPORTATION FRAMEWORK STUDY
MODEL RESULTS FOR TIER 2 ALTERNATIVES



HIDDEN VALLEY BUILDOUT DAILY TRAFFIC VOLUMES
REVISED/UPDATED SUB-AREA MODEL
ALTERNATIVE A NETWORK

WILSON & COMPANY

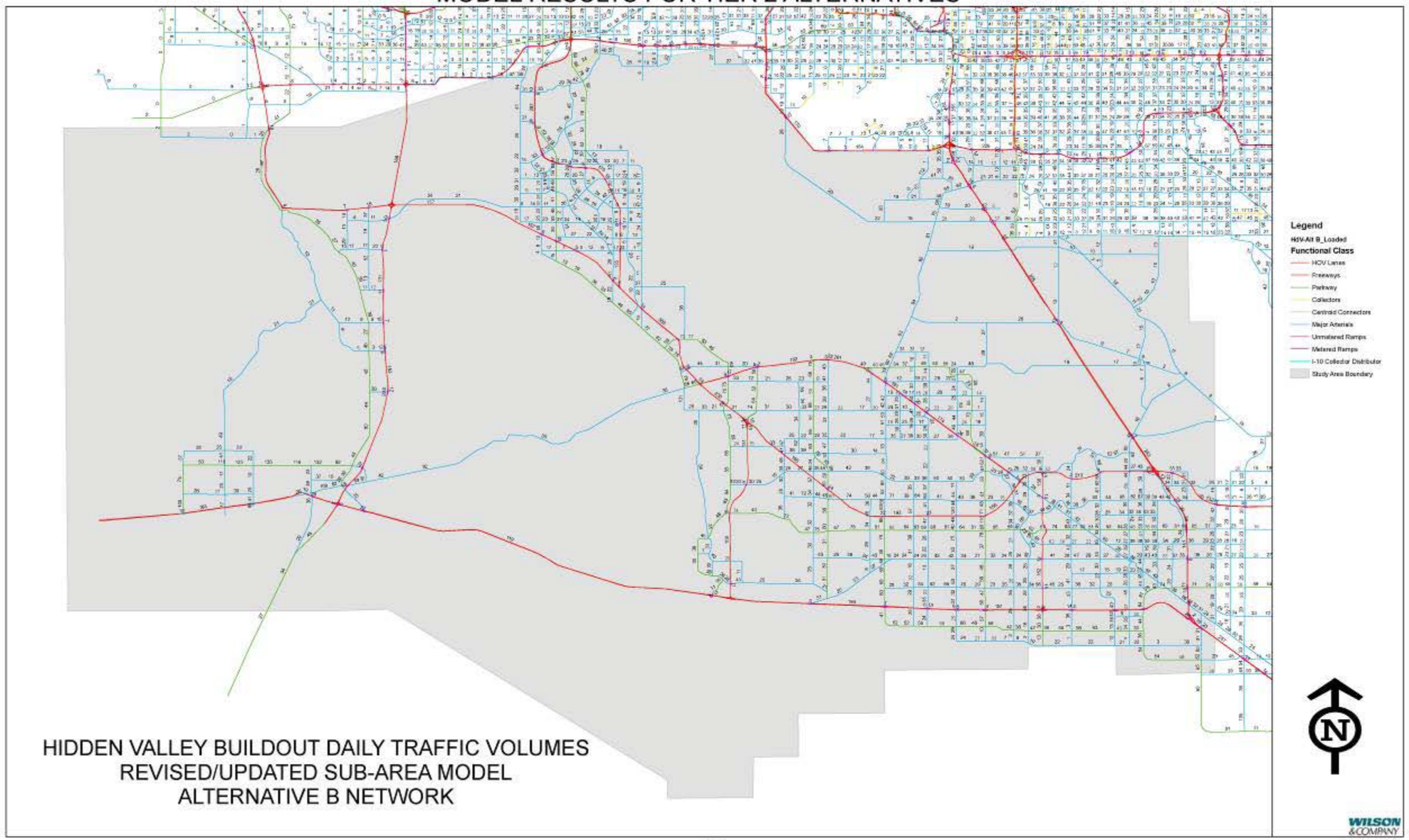
I-8/I-10 HIDDEN VALLEY TRANSPORTATION FRAMEWORK STUDY
MODEL RESULTS FOR TIER 2 ALTERNATIVES



HIDDEN VALLEY BUILDOUT DAILY TRAFFIC VOLUMES
REVISED/UPDATED SUB-AREA MODEL
ALTERNATIVE A1 NETWORK

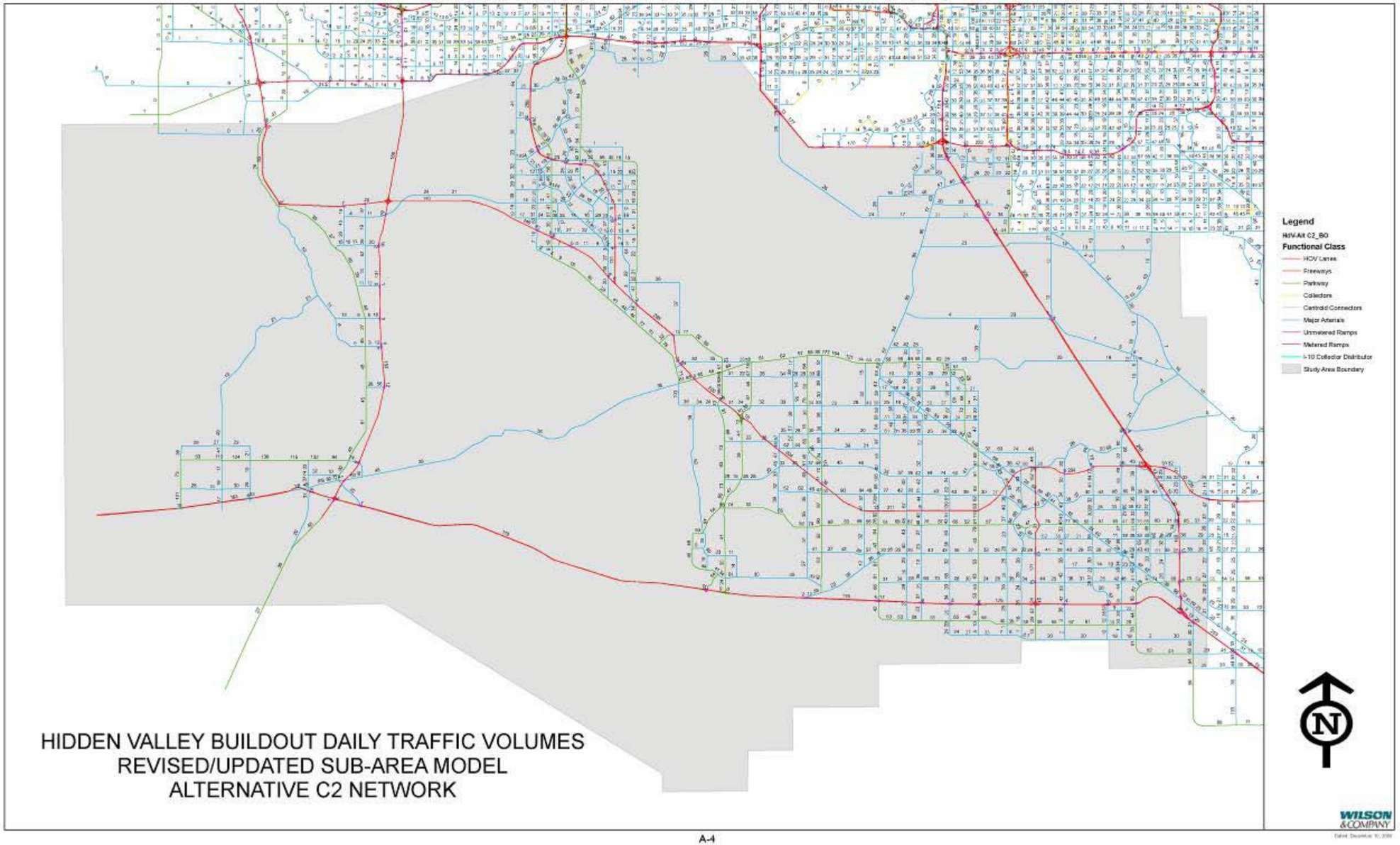
WILSON & COMPANY

I-8/I-10 HIDDEN VALLEY TRANSPORTATION FRAMEWORK STUDY
MODEL RESULTS FOR TIER 2 ALTERNATIVES



HIDDEN VALLEY BUILDOUT DAILY TRAFFIC VOLUMES
REVISED/UPDATED SUB-AREA MODEL
ALTERNATIVE B NETWORK

I-8/I-10 HIDDEN VALLEY TRANSPORTATION FRAMEWORK STUDY
MODEL RESULTS FOR TIER 2 ALTERNATIVES



HIDDEN VALLEY BUILDOUT DAILY TRAFFIC VOLUMES
REVISED/UPDATED SUB-AREA MODEL
ALTERNATIVE C2 NETWORK

WILSON & COMPANY

APPENDIX B

EVALUATION OF MODEL RESULTS FOR TIER 2 ALTERNATIVES BY CORRIDOR

EVALUATION OF MODEL RESULTS FOR TIER 2 ALTERNATIVES BY CORRIDOR: ALTERNATIVE A

Roadway	From	To	Length (Miles)	Vehicle Miles of Travel (VMT)	No. of Lanes	Roadway Type (Modeled)	Average Volume [1]	Highest Volume	Lowest Volume	Lane Capacity	Roadway Capacity	Average Volume-to-Capacity (v/c) Ratio [2]	Highest v/c Ratio [2]	Recommended Functional Classification
Anderson Rd	Interstate 8	SR-84	3.6	187,000	6	Pkwy	52,600	51,000	44,000	15,000	90,000	0.58	0.57	Parkway
Anderson Rd	SR-84	Kortsen Rd	2.0	102,000	6	Pkwy	51,500	78,000	40,000	15,000	90,000	0.57	0.87	Parkway
Anderson Rd	Kortsen Rd	Hassayampa Fwy	1.1	100,000	6	Pkwy	95,300	114,000	78,000	15,000	90,000	**1.06**	**1.27**	Parkway
Anderson Rd	Hassayampa Fwy	Maricopa-Casa Grande Hwy	4.2	338,000	6	Pkwy	81,000	99,000	61,000	15,000	90,000	**0.90**	**1.10**	Parkway
Countyline Pkwy	Hassayampa Fwy	SR-238	4.7	218,000	6	Pkwy	46,100	75,000	26,000	15,000	90,000	0.51	0.83	Parkway
Florence Blvd/SR-84/SR-287	Interstate 8	SR-347	5.8	175,000	4	Major Arterial	30,300	35,000	23,000	10,900	43,600	0.69	0.80	Major Arterial
Florence Blvd/SR-84/SR-287	SR-347	Montgomery Rd	11.0	323,000	4	Major Arterial	29,300	43,000	6,000	10,900	43,600	0.67	**0.99**	Major Arterial
Florence Blvd/SR-84/SR-287	Montgomery Rd	Pinal Ave (SR-387)	6.0	212,000	4	Major Arterial	35,300	46,000	25,000	10,900	43,600	0.81	**1.06**	Major Arterial
Florence Blvd/SR-84/SR-287	Pinal Ave (SR-387)	Interstate 10	4.0	198,000	4	Major Arterial	49,500	81,000	28,000	10,900	43,600	**1.14**	**1.86**	Major Arterial
Hassayampa Fwy	Picacho Vista Fwy	Interstate 10	16.5	1,950,000	6	Fwy	118,300	163,000	86,000	25,400	152,400	0.78	**1.07**	Freeway
Hassayampa Fwy	Interstate 10	Maricopa-Casa Grande Hwy	9.5	1,851,000	6	Fwy	194,300	215,000	94,000	25,400	152,400	**1.27**	**1.41**	Freeway
Hassayampa Fwy	Maricopa-Casa Grande Hwy	SR-347	10.5	1,984,000	6	Fwy	189,500	230,000	132,000	25,400	152,400	**1.24**	**1.51**	Freeway
Hassayampa Fwy	SR-347	SR-303S (303 Spur)	12.2	2,232,000	6	Fwy	182,500	209,000	140,000	25,400	152,400	**1.20**	**1.37**	Freeway
Hassayampa Fwy	SR-303S (303 Spur)	SR-303L	13.0	3,311,000	8	Fwy	254,800	302,000	155,000	25,400	203,200	**1.25**	**1.49**	Freeway
Hassayampa Fwy	SR-303L	SR-85	17.3	2,405,000	6	Fwy	138,900	153,000	105,000	25,400	152,400	**0.91**	**1.00**	Freeway
Hassayampa Fwy	SR-85	Southern Ave	19.4	1,816,000	6	Fwy	93,400	134,000	77,000	25,400	152,400	0.61	0.88	Freeway
Hassayampa Fwy	Southern Ave	Interstate 10	6.1	418,000	8	Fwy	68,500	79,000	73,000	25,400	203,200	0.34	0.39	Freeway
Hidden Waters Pkwy	Maricopa Scenic Way	Watermelon Rd	1.6	46,000	2	Pkwy	29,000	30,000	25,000	15,000	30,000	**0.97**	**1.00**	Parkway
Hidden Waters Pkwy	Watermelon Rd	Woods Rd	10.3	538,000	4	Pkwy	52,400	80,000	27,000	15,000	60,000	0.87	**1.33**	Parkway
Hidden Waters Pkwy	Woods Rd	Gillespie Dam	5.4	214,000	4	Pkwy	39,500	40,000	39,000	15,000	60,000	0.66	0.67	Parkway
Hidden Waters Pkwy	Gillespie Dam	SR-801	15.3	474,000	6	Pkwy	31,000	41,000	22,000	15,000	90,000	0.34	0.46	Parkway
Hidden Waters Pkwy	SR-801	Interstate 10	7.7	84,000	6	Pkwy	10,900	15,000	6,000	15,000	90,000	0.12	0.17	Parkway
Hidden Waters Pkwy (Hassayampa Model) [3]	Gillespe Dam	SR-801	15.3	720,000	6	Pkwy	47,100	58,000	42,000	15,000	90,000	0.52	0.64	Parkway
Hidden Waters Pkwy (Hassayampa Model) [3]	SR-801	Interstate 10	7.7	533,000	6	Pkwy	69,100	85,000	55,000	15,000	90,000	0.77	**0.94**	Parkway
Hombre de Agua	Cotton Lane	Sonoran Valley Pkwy	15.5	264,000	4	Major Arterial	17,000	25,000	17,000	10,900	43,600	0.39	0.57	Major Arterial
Interstate 8	Paloma Rd	SR-85	11.6	1,916,000	4	Fwy	165,600	198,000	104,000	25,400	101,600	**1.63**	**1.95**	Freeway
Interstate 8	SR-85	SR-303 Spur	28.4	3,383,000	4	Fwy	119,300	144,000	90,000	25,400	101,600	**1.17**	**1.42**	Freeway
Interstate 8	SR-303 Spur	SR-347	10.7	2,029,000	6	Fwy	189,700	202,000	176,000	25,400	152,400	**1.24**	**1.33**	Freeway
Interstate 8	SR-347	Anderson Rd	7.0	1,399,000	6	Fwy	200,900	212,000	173,000	25,400	152,400	**1.32**	**1.39**	Freeway
Interstate 8	Anderson Rd	Montgomery Rd	4.1	721,000	6	Fwy	177,300	186,000	139,000	25,400	152,400	**1.16**	**1.22**	Freeway
Interstate 8	Montgomery Rd	Trekell Rd	7.0	1,367,000	6	Fwy	196,000	215,000	144,000	25,400	152,400	**1.29**	**1.41**	Freeway
Interstate 8	Trekell Rd	Interstate 10	3.0	634,000	6	Fwy	214,900	214,000	159,000	25,400	152,400	**1.41**	**1.40**	Freeway
Interstate 10	Riggs Rd	Casa Blanca Rd	8.6	2,533,000	8	Fwy	294,500	305,000	239,000	25,400	203,200	**1.45**	**1.50**	Freeway
Interstate 10	Casa Blanca Rd	SR-387/Pinal Ave	9.2	2,616,000	8	Fwy	284,100	284,000	229,000	25,400	203,200	**1.40**	**1.40**	Freeway
Interstate 10	SR-387/Pinal Ave	Hassayampa Fwy	2.6	637,000	9	Fwy	241,100	244,000	229,000	25,400	228,600	**1.05**	**1.07**	Freeway
Interstate 10	Hassayampa Fwy	Kortsen Rd	4.9	623,000	8	Fwy	128,300	138,000	105,000	25,400	203,200	0.63	0.68	Freeway
Interstate 10	Kortsen Rd	Selma Hwy	4.1	531,000	8	Fwy	129,200	139,000	110,000	25,400	203,200	0.64	0.68	Freeway
Interstate 10	Selma Hwy	Interstate 8	2.1	269,000	8	Fwy	125,500	137,000	112,000	25,400	203,200	0.62	0.67	Freeway
Interstate 10	Interstate 8	Toltec Rd	5.3	1,174,000	8	Fwy	221,200	255,000	220,000	25,400	203,200	**1.09**	**1.25**	Freeway
Kortsen Rd	Vekol Valley Pkwy	SR-303S (303 Spur)	0.4	16,000	6	Pkwy	46,800	57,000	45,000	15,000	90,000	0.52	0.63	Major Arterial
Kortsen Rd	SR-303S (303 Spur)	Warren Rd	6.3	295,000	6	Pkwy	46,800	71,000	37,000	15,000	90,000	0.52	0.79	Major Arterial
Kortsen Rd	Warren Rd	SR-347	5.0	347,000	6	Pkwy	69,900	82,000	54,000	15,000	90,000	0.78	**0.91**	Parkway
Kortsen Rd	SR-347	Anderson Rd	7.0	482,000	6	Pkwy	68,900	87,000	51,000	15,000	90,000	0.77	**0.97**	Parkway
Kortsen Rd	Anderson Rd	Montgomery Rd	4.4	252,000	6	Pkwy	58,000	73,000	44,000	15,000	90,000	0.64	0.81	Parkway
Kortsen Rd	Montgomery Rd	Pinal Ave (SR-387)	5.7	363,000	6	Pkwy	63,400	83,000	50,000	15,000	90,000	0.70	**0.92**	Parkway
Kortsen Rd	Pinal Ave (SR-387)	Interstate 10	3.9	249,000	6	Pkwy	63,300	85,000	48,000	15,000	90,000	0.70	**0.94**	Parkway
Montgomery Rd	Interstate 8	Kortsen Rd	5.3	816,000	6	Fwy	153,400	160,000	122,000	25,400	152,400	**1.01**	**1.05**	Freeway
Montgomery Rd	Kortsen Rd	Hassayampa Fwy	3.6	552,000	6	Fwy	153,700	163,000	120,000	25,400	152,400	**1.01**	**1.07**	Freeway

EVALUATION OF MODEL RESULTS FOR TIER 2 ALTERNATIVES BY CORRIDOR: ALTERNATIVE A (CONTINUED)

Roadway	From	To	Length (Miles)	Vehicle Miles of Travel (VMT)	No. of Lanes	Roadway Type (Modeled)	Average Volume [1]	Highest Volume	Lowest Volume	Lane Capacity	Roadway Capacity	Average Volume-to-Capacity (*v/c*) Ratio [2]	Highest *v/c* Ratio [2]	Recommended Functional Classification
North-East Maricopa Loop	Maricopa-Casa Grande Hwy	Honeycutt Rd	4.1	248,000	6	Pkwy	60,900	72,000	51,000	15,000	90,000	0.68	0.80	Parkway
North-East Maricopa Loop	Honeycutt Rd	SR-238/SR-347	7.1	380,000	6	Pkwy	53,400	65,000	29,000	15,000	90,000	0.59	0.72	Parkway
Sonoran Valley-Rainbow Valley Rds	SR-238	Casa Blanca Rd	3.2	237,000	6	Pkwy	73,200	75,000	71,000	15,000	90,000	0.81	0.83	Parkway
Sonoran Valley-Rainbow Valley Rds	Casa Blanca Rd	Dysart Rd	2.1	172,000	8	Pkwy	80,300	82,000	77,000	15,000	120,000	0.67	0.68	Parkway
Sonoran Valley-Rainbow Valley Rds	Dysart Rd	Hassayampa Fwy	9.0	289,000	6	Pkwy	32,300	63,000	7,000	15,000	90,000	0.36	0.70	Parkway
Sonoran Valley-Rainbow Valley Rds	Hassayampa Fwy	Queen Creek Rd	2.4	105,000	6	Pkwy	44,400	56,000	36,000	15,000	90,000	0.49	0.62	Parkway
Sonoran Valley-Rainbow Valley Rds	Queen Creek Rd	SR-303L	6.1	292,000	6	Pkwy	47,700	79,000	57,000	15,000	90,000	0.53	0.88	Parkway
SR-85 Freeway	Interstate 8	Maricopa Scenic Way	1.8	203,000	4	Fwy	110,700	154,000	35,000	25,400	101,600	**1.09**	**1.52**	Freeway
SR-85 Freeway	Maricopa Scenic Way	Hassayampa Fwy	20.1	2,994,000	4	Fwy	148,700	170,000	118,000	25,400	101,600	**1.46**	**1.67**	Freeway
SR-85 Freeway	Hassayampa Fwy	SR-801	8.5	1,403,000	6	Fwy	165,400	170,000	108,000	25,400	152,400	**1.09**	**1.12**	Freeway
SR-85 Freeway	SR-801	Interstate 10	4.4	492,000	8	Fwy	111,000	125,000	90,000	25,400	203,200	0.55	0.62	Freeway
SR-238	Sonoran Valley Pkwy	Hassayampa Fwy	1.2	67,000	6	Pkwy	56,600	60,000	56,000	15,000	90,000	0.63	0.67	Parkway
SR-238	Hassayampa Fwy	Vekol Valley Pkwy	2.0	106,000	6	Pkwy	54,000	63,000	47,000	15,000	90,000	0.60	0.70	Parkway
SR-238	Vekol Valley Pkwy	Countyline Pkwy	2.2	128,000	6	Pkwy	59,600	73,000	47,000	15,000	90,000	0.66	0.81	Parkway
SR-238	Countyline Pkwy	Warren Rd	3.9	229,000	6	Pkwy	58,100	62,000	54,000	15,000	90,000	0.65	0.69	Parkway
SR-238	Warren Rd	SR-347	5.3	583,000	6	Pkwy	109,600	178,000	63,000	15,000	90,000	**1.22**	**1.98**	Parkway
SR-238	SR-347	White and Parker Rd	3.5	146,000	6	Major Arterial	41,800	38,000	38,000	10,900	65,400	0.64	0.58	Parkway
SR-238	White and Parker Rd	Anderson Rd	5.1	398,000	6	Major Arterial	78,500	92,000	53,000	10,900	65,400	**1.20**	**1.41**	Parkway
SR-238	Anderson Rd	Hassayampa Fwy	3.0	211,000	4	Major Arterial	69,500	86,000	43,000	10,900	43,600	**1.59**	**1.97**	Parkway
SR-303L (Estrella Fwy Extension)	Hassayampa Fwy	Cotton Lane	9.5	1,400,000	8	Fwy	148,100	173,000	130,000	25,400	203,200	0.73	0.85	Freeway
SR-303L (Estrella Fwy Extension)	Cotton Lane	SR-801	12.2	2,821,000	8	Fwy	231,300	295,000	147,000	25,400	203,200	**1.14**	**1.45**	Freeway
SR-303L (Estrella Fwy Extension)	SR-801	Interstate 10	4.7	785,000	8	Fwy	166,700	202,000	92,000	25,400	203,200	0.82	**0.99**	Freeway
SR-303S (303 Spur)	Interstate 8	Hassayampa Fwy	11.9	1,461,000	4	Fwy	122,300	138,000	87,000	25,400	101,600	**1.20**	**1.36**	Freeway
SR-347	Interstate 8	SR-84	2.9	166,000	6	Pkwy	57,500	62,000	46,000	15,000	90,000	0.64	0.69	Parkway
SR-347	SR-84	Barnes Rd	2.8	169,000	6	Pkwy	61,000	81,000	38,000	15,000	90,000	0.68	**0.90**	Parkway
SR-347	Barnes Rd	Hassayampa Fwy	0.5	40,000	6	Pkwy	87,500	88,000	83,000	15,000	90,000	**0.97**	**0.98**	Parkway
SR-347	Hassayampa Fwy	Val Vista Rd	2.7	225,000	6	Major Arterial	83,700	104,000	67,000	10,900	65,400	**1.28**	**1.59**	Parkway
SR-347	Val Vista Rd	Farrell Rd	4.6	353,000	6	Major Arterial	76,500	97,000	55,000	10,900	65,400	**1.17**	**1.48**	Parkway
SR-347	Farrell Rd	Maricopa-Casa Grande Hwy	2.0	85,000	6	Major Arterial	43,600	46,000	39,000	10,900	65,400	0.67	0.70	Parkway
SR-347	Maricopa-Casa Grande Hwy	SR-238	1.0	66,000	6	Major Arterial	63,100	63,000	60,000	10,900	65,400	**0.96**	**0.96**	Parkway
SR-347	SR-238	Hiller Rd	1.1	71,000	6	Major Arterial	63,100	69,000	58,000	10,900	65,400	**0.96**	**1.06**	Parkway
SR-347	Hiller Rd	Riggs Rd	9.6	889,000	6	Major Arterial	92,500	96,000	85,000	10,900	65,400	**1.41**	**1.47**	Parkway
Vekol Valley Pkwy	Interstate 8	Peters Rd	3.2	67,000	6	Pkwy	21,100	25,000	12,000	15,000	90,000	0.23	0.28	Major Arterial
Vekol Valley Pkwy	Peters Rd	Barnes Rd	6.2	291,000	6	Pkwy	46,700	63,000	31,000	15,000	90,000	0.52	0.70	Major Arterial
Vekol Valley Pkwy	Barnes Rd	Hassayampa Fwy	6.7	424,000	6	Pkwy	63,100	75,000	60,000	15,000	90,000	0.70	0.83	Major Arterial
Vekol Valley Pkwy	Hassayampa Fwy	SR-238	2.0	170,000	6	Pkwy	84,700	106,000	60,000	15,000	90,000	**0.94**	**1.18**	Parkway
Vekol Valley Pkwy	SR-238	Hassayampa Fwy	4.9	297,000	6	Pkwy	60,300	79,000	50,000	15,000	90,000	0.67	0.88	Parkway
Watermelon Rd	Paloma Rd	Citrus Valley Rd	4.9	420,000	4	Pkwy	86,000	123,000	53,000	15,000	60,000	**1.43**	**2.05**	Parkway
Watermelon Rd	Citrus Valley Rd	Gila Blvd	4.0	507,000	4	Pkwy	126,200	136,000	116,000	15,000	60,000	**2.10**	**2.27**	Parkway
Watermelon Rd	Gila Blvd	Hidden Waters Pkwy	2.8	296,000	4	Pkwy	105,400	132,000	93,000	15,000	60,000	**1.76**	**2.20**	Parkway
Warren Rd-Ralston Rd	Selma Hwy	Barnes Rd	2.5	122,000	6	Pkwy	48,800	81,000	38,000	15,000	90,000	0.54	**0.90**	Parkway
Warren Rd-Ralston Rd	Barnes Rd	Hassayampa Fwy	2.3	144,000	6	Pkwy	63,200	71,000	50,000	15,000	90,000	0.70	0.79	Parkway
Warren Rd-Ralston Rd	Hassyampa Fwy	SR-238	9.4	660,000	6	Pkwy	70,500	107,000	41,000	15,000	90,000	0.78	**1.19**	Parkway

EVALUATION OF MODEL RESULTS FOR TIER 2 ALTERNATIVES BY CORRIDOR: ALTERNATIVE A1

Roadway	From	To	Length (Miles)	Vehicle Miles of Travel (VMT)	No. of Lanes	Roadway Type (Modeled)	Average Volume [1]	Highest Volume	Lowest Volume	Lane Capacity	Roadway Capacity	Average Volume-to-Capacity (*v/c*) Ratio [2]	Highest *v/c* Ratio [2]	Recommended Functional Classification
Anderson Rd	Interstate 8	SR-84	3.6	188,000	6	Pkwy	52,900	61,000	44,000	15,000	90,000	0.59	0.68	Parkway
Anderson Rd	SR-84	Kortsen Rd	2.0	101,000	6	Pkwy	51,500	78,000	40,000	15,000	90,000	0.57	0.87	Parkway
Anderson Rd	Kortsen Rd	Hassayampa Fwy	1.1	100,000	6	Pkwy	95,600	114,000	79,000	15,000	90,000	**1.06**	**1.27**	Parkway
Anderson Rd	Hassayampa Fwy	Maricopa-Casa Grande Hwy	4.2	337,000	6	Pkwy	80,800	99,000	61,000	15,000	90,000	**0.90**	**1.10**	Parkway
Countyline Pkwy	Hassayampa Fwy	SR-238	4.7	218,000	6	Pkwy	46,200	75,000	26,000	15,000	90,000	0.51	0.83	Parkway
Florence Blvd/SR-84/SR-287	Interstate 8	SR-347	5.8	174,000	4	Major Arterial	30,200	35,000	23,000	10,900	43,600	0.69	0.80	Major Arterial
Florence Blvd/SR-84/SR-287	SR-347	Montgomery Rd	11.0	321,000	4	Major Arterial	29,100	43,000	6,000	10,900	43,600	0.67	**0.99**	Major Arterial
Florence Blvd/SR-84/SR-287	Montgomery Rd	Pinal Ave (SR-387)	6.0	212,000	4	Major Arterial	35,300	46,000	27,000	10,900	43,600	0.81	**1.06**	Major Arterial
Florence Blvd/SR-84/SR-287	Pinal Ave (SR-387)	Interstate 10	4.0	199,000	4	Major Arterial	49,700	80,000	29,000	10,900	43,600	**1.14**	**1.83**	Major Arterial
Hassayampa Fwy	Picacho Vista Fwy	Interstate 10	16.5	1,958,000	6	Fwy	118,700	133,000	77,000	25,400	152,400	0.78	0.87	Freeway
Hassayampa Fwy	Interstate 10	Maricopa-Casa Grande Hwy	9.5	1,854,000	6	Fwy	194,700	215,000	183,000	25,400	152,400	**1.28**	**1.41**	Freeway
Hassayampa Fwy	Maricopa-Casa Grande Hwy	SR-347	10.5	1,978,000	6	Fwy	188,900	230,000	157,000	25,400	152,400	**1.24**	**1.51**	Freeway
Hassayampa Fwy	SR-347	SR-303S (303 Spur)	12.2	2,234,000	6	Fwy	182,700	208,000	165,000	25,400	152,400	**1.20**	**1.36**	Freeway
Hassayampa Fwy	SR-303S (303 Spur)	SR-303L	13.0	3,298,000	8	Fwy	253,800	302,000	212,000	25,400	203,200	**1.25**	**1.49**	Freeway
Hassayampa Fwy	SR-303L	SR-85	17.3	2,424,000	6	Fwy	139,900	153,000	121,000	25,400	152,400	**0.92**	**1.00**	Freeway
Hassayampa Fwy	SR-85	Southern Ave	19.4	1,830,000	6	Fwy	94,100	136,000	87,000	25,400	152,400	0.62	0.89	Freeway
Hassayampa Fwy	Southern Ave	Interstate 10	6.1	420,000	8	Fwy	68,800	79,000	19,000	25,400	203,200	0.34	0.39	Freeway
Hidden Waters Pkwy	Maricopa Scenic Way	Watermelon Rd	1.6	46,000	4	Pkwy	28,900	30,000	25,000	15,000	60,000	0.48	0.50	Parkway
Hidden Waters Pkwy	Watermelon Rd	Woods Rd	10.3	536,000	8	Pkwy	52,300	80,000	27,000	15,000	120,000	0.44	0.67	Parkway
Hidden Waters Pkwy	Woods Rd	Gillespie Dam	5.4	212,000	8	Pkwy	39,200	40,000	38,000	15,000	120,000	0.33	0.33	Parkway
Hidden Waters Pkwy	Gillespie Dam	SR-801	15.3	476,000	6	Pkwy	31,100	41,000	22,000	15,000	90,000	0.35	0.46	Parkway
Hidden Waters Pkwy	SR-801	Interstate 10	7.7	84,000	6	Pkwy	10,800	15,000	6,000	15,000	90,000	0.12	0.17	Parkway
Hidden Waters Pkwy (Hassayampa Model) [3]	Gillespe Dam	SR-801	15.3	720,000	6	Pkwy	47,100	58,000	42,000	15,000	90,000	0.52	0.64	Parkway
Hidden Waters Pkwy (Hassayampa Model) [3]	SR-801	Interstate 10	7.7	533,000	6	Pkwy	69,100	85,000	55,000	15,000	90,000	0.77	**0.94**	Parkway
Hombre de Agua	Cotton Lane	Sonoran Valley Pkwy	15.5	489,000	6	Pkwy	31,500	64,000	17,000	15,000	90,000	0.35	0.71	Major Arterial
Interstate 8	Paloma Rd	SR-85	11.6	1,918,000	4	Fwy	165,900	199,000	70,000	25,400	101,600	**1.63**	**1.96**	Freeway
Interstate 8	SR-85	SR-303 Spur	28.4	3,381,000	4	Fwy	119,300	144,000	103,000	25,400	101,600	**1.17**	**1.42**	Freeway
Interstate 8	SR-303 Spur	SR-347	10.7	2,030,000	6	Fwy	189,800	203,000	176,000	25,400	152,400	**1.25**	**1.33**	Freeway
Interstate 8	SR-347	Anderson Rd	7.0	1,399,000	6	Fwy	200,800	212,000	178,000	25,400	152,400	**1.32**	**1.39**	Freeway
Interstate 8	Anderson Rd	Montgomery Rd	4.1	721,000	6	Fwy	177,500	186,000	140,000	25,400	152,400	**1.16**	**1.22**	Freeway
Interstate 8	Montgomery Rd	Trekell Rd	7.0	1,369,000	6	Fwy	196,300	215,000	144,000	25,400	152,400	**1.29**	**1.41**	Freeway
Interstate 8	Trekell Rd	Interstate 10	3.0	635,000	6	Fwy	215,400	215,000	177,000	25,400	152,400	**1.41**	**1.41**	Freeway
Interstate 10	Riggs Rd	Casa Blanca Rd	8.6	2,531,000	8	Fwy	294,300	305,000	239,000	25,400	203,200	**1.45**	**1.50**	Freeway
Interstate 10	Casa Blanca Rd	SR-387/Pinal Ave	9.2	2,613,000	8	Fwy	283,900	284,000	280,000	25,400	203,200	**1.40**	**1.40**	Freeway
Interstate 10	SR-387/Pinal Ave	Hassayampa Fwy	2.6	638,000	9	Fwy	241,600	245,000	229,000	25,400	228,600	**1.06**	**1.07**	Freeway
Interstate 10	Hassayampa Fwy	Kortsen Rd	4.9	625,000	8	Fwy	128,800	138,000	105,000	25,400	203,200	0.63	0.68	Freeway
Interstate 10	Kortsen Rd	Selma Hwy	4.1	532,000	8	Fwy	129,500	139,000	106,000	25,400	203,200	0.64	0.68	Freeway
Interstate 10	Selma Hwy	Interstate 8	2.1	269,000	8	Fwy	125,300	137,000	109,000	25,400	203,200	0.62	0.67	Freeway
Interstate 10	Interstate 8	Toltec Rd	5.3	1,168,000	8	Fwy	220,000	255,000	219,000	25,400	203,200	**1.08**	**1.25**	Freeway
Kortsen Rd	Vekol Valley Pkwy	SR-303S (303 Spur)	0.4	16,000	6	Pkwy	46,500	57,000	44,000	15,000	90,000	0.52	0.63	Major Arterial
Kortsen Rd	SR-303S (303 Spur)	Warren Rd	6.3	294,000	6	Pkwy	46,600	71,000	37,000	15,000	90,000	0.52	0.79	Major Arterial
Kortsen Rd	Warren Rd	SR-347	5.0	348,000	6	Pkwy	70,200	82,000	54,000	15,000	90,000	0.78	**0.91**	Parkway
Kortsen Rd	SR-347	Anderson Rd	7.0	484,000	6	Pkwy	69,100	85,000	51,000	15,000	90,000	0.77	**0.94**	Parkway
Kortsen Rd	Anderson Rd	Montgomery Rd	4.4	253,000	6	Pkwy	58,100	66,000	45,000	15,000	90,000	0.65	0.73	Parkway
Kortsen Rd	Montgomery Rd	Pinal Ave (SR-387)	5.7	362,000	6	Pkwy	63,100	83,000	50,000	15,000	90,000	0.70	**0.92**	Parkway
Kortsen Rd	Pinal Ave (SR-387)	Interstate 10	3.9	249,000	6	Pkwy	63,300	86,000	48,000	15,000	90,000	0.70	**0.96**	Parkway
Montgomery Rd	Interstate 8	Kortsen Rd	5.3	815,000	6	Fwy	153,100	159,000	157,000	25,400	152,400	**1.00**	**1.04**	Freeway
Montgomery Rd	Kortsen Rd	Hassayampa Fwy	3.6	550,000	6	Fwy	153,000	161,000	145,000	25,400	152,400	**1.00**	**1.06**	Freeway

EVALUATION OF MODEL RESULTS FOR TIER 2 ALTERNATIVES BY CORRIDOR: ALTERNATIVE A1 (CONTINUED)

Roadway	From	To	Length (Miles)	Vehicle Miles of Travel (VMT)	No. of Lanes	Roadway Type (Modeled)	Average Volume (1)	Highest Volume	Lowest Volume	Lane Capacity	Roadway Capacity	Average Volume-to-Capacity (v/c) Ratio (2)	Highest v/c Ratio (2)	Recommended Functional Classification
North-East Maricopa Loop	Maricopa-Casa Grande Hwy	Honeycutt Rd	4.1	248,000	6	Pkwy	60,900	73,000	52,000	15,000	90,000	0.68	0.81	Parkway
North-East Maricopa Loop	Honeycutt Rd	SR-238/SR-347	7.1	376,000	6	Pkwy	52,900	65,000	28,000	15,000	90,000	0.59	0.72	Parkway
Sonoran Valley-Rainbow Valley Rds	SR-238	Casa Blanca Rd	3.2	239,000	6	Pkwy	74,100	76,000	72,000	15,000	90,000	0.82	0.84	Parkway
Sonoran Valley-Rainbow Valley Rds	Casa Blanca Rd	Dysart Rd	2.1	175,000	8	Pkwy	81,800	83,000	79,000	15,000	120,000	0.68	0.69	Parkway
Sonoran Valley-Rainbow Valley Rds	Dysart Rd	Hassayampa Fwy	9.0	261,000	6	Pkwy	29,200	47,000	7,000	15,000	90,000	0.32	0.52	Parkway
Sonoran Valley-Rainbow Valley Rds	Hassayampa Fwy	Queen Creek Rd	2.4	106,000	6	Pkwy	44,600	56,000	36,000	15,000	90,000	0.50	0.62	Parkway
Sonoran Valley-Rainbow Valley Rds	Queen Creek Rd	SR-303L	6.1	293,000	6	Pkwy	47,800	78,000	37,000	15,000	90,000	0.53	0.87	Parkway
SR-85 Freeway	Interstate 8	Maricopa Scenic Way	1.8	202,000	4	Fwy	110,400	154,000	35,000	25,400	101,600	**1.09**	**1.52**	Freeway
SR-85 Freeway	Maricopa Scenic Way	Hassayampa Fwy	20.1	2,999,000	4	Fwy	149,000	170,000	117,000	25,400	101,600	**1.47**	**1.67**	Freeway
SR-85 Freeway	Hassayampa Fwy	SR-801	8.5	1,401,000	6	Fwy	165,300	169,000	108,000	25,400	152,400	**1.08**	**1.11**	Freeway
SR-85 Freeway	SR-801	Interstate 10	4.4	493,000	8	Fwy	111,400	125,000	90,000	25,400	203,200	0.55	0.62	Freeway
SR-238	Sonoran Valley Pkwy	Hassayampa Fwy	1.2	67,000	6	Pkwy	56,200	60,000	48,000	15,000	90,000	0.62	0.67	Parkway
SR-238	Hassayampa Fwy	Vekol Valley Pkwy	2.0	106,000	6	Pkwy	53,900	63,000	45,000	15,000	90,000	0.60	0.70	Parkway
SR-238	Vekol Valley Pkwy	Countyline Pkwy	2.2	128,000	6	Pkwy	59,300	73,000	47,000	15,000	90,000	0.66	0.81	Parkway
SR-238	Countyline Pkwy	Warren Rd	3.9	229,000	6	Pkwy	58,100	62,000	54,000	15,000	90,000	0.65	0.69	Parkway
SR-238	Warren Rd	SR-347	5.3	582,000	6	Pkwy	109,400	178,000	63,000	15,000	90,000	**1.22**	**1.98**	Parkway
SR-238	SR-347	White and Parker Rd	3.5	146,000	6	Major Arterial	41,900	38,000	38,000	10,900	65,400	0.64	0.58	Parkway
SR-238	White and Parker Rd	Anderson Rd	5.1	400,000	6	Major Arterial	78,800	92,000	53,000	10,900	65,400	**1.20**	**1.41**	Parkway
SR-238	Anderson Rd	Hassayampa Fwy	3.0	211,000	4	Major Arterial	69,500	86,000	43,000	10,900	43,600	**1.59**	**1.97**	Parkway
SR-303L (Estrella Fwy Extension)	Hassayampa Fwy	Cotton Lane	9.5	1,372,000	8	Fwy	145,100	168,000	126,000	25,400	203,200	0.71	0.83	Freeway
SR-303L (Estrella Fwy Extension)	Cotton Lane	SR-801	12.2	2,817,000	8	Fwy	231,000	296,000	145,000	25,400	203,200	**1.14**	**1.46**	Freeway
SR-303L (Estrella Fwy Extension)	SR-801	Interstate 10	4.7	785,000	8	Fwy	166,500	203,000	91,000	25,400	203,200	0.82	**1.00**	Freeway
SR-303S (303 Spur)	Interstate 8	Hassayampa Fwy	11.9	1,460,000	4	Fwy	122,300	138,000	87,000	25,400	101,600	**1.20**	**1.36**	Freeway
SR-347	Interstate 8	SR-84	2.9	166,000	6	Pkwy	57,300	62,000	47,000	15,000	90,000	0.64	0.69	Parkway
SR-347	SR-84	Barnes Rd	2.8	169,000	6	Pkwy	61,100	81,000	38,000	15,000	90,000	0.68	**0.90**	Parkway
SR-347	Barnes Rd	Hassayampa Fwy	0.5	40,000	6	Pkwy	87,300	88,000	72,000	15,000	90,000	**0.97**	**0.98**	Parkway
SR-347	Hassayampa Fwy	Val Vista Rd	2.7	225,000	6	Major Arterial	83,600	104,000	66,000	10,900	65,400	**1.28**	**1.59**	Parkway
SR-347	Val Vista Rd	Farrell Rd	4.6	350,000	6	Major Arterial	75,900	96,000	55,000	10,900	65,400	**1.16**	**1.47**	Parkway
SR-347	Farrell Rd	Maricopa-Casa Grande Hwy	2.0	84,000	6	Major Arterial	43,200	46,000	39,000	10,900	65,400	0.66	0.70	Parkway
SR-347	Maricopa-Casa Grande Hwy	SR-238	1.0	66,000	6	Major Arterial	63,400	63,100	60,000	10,900	65,400	**0.97**	**0.96**	Parkway
SR-347	SR-238	Hiller Rd	1.1	71,000	6	Major Arterial	62,900	69,000	57,000	10,900	65,400	**0.96**	**1.06**	Parkway
SR-347	Hiller Rd	Riggs Rd	9.6	890,000	6	Major Arterial	92,600	95,000	85,000	10,900	65,400	**1.42**	**1.45**	Parkway
Vekol Valley Pkwy	Interstate 8	Peters Rd	3.2	67,000	6	Pkwy	21,200	25,000	12,000	15,000	90,000	0.24	0.28	Major Arterial
Vekol Valley Pkwy	Peters Rd	Barnes Rd	6.2	292,000	6	Pkwy	46,800	64,000	31,000	15,000	90,000	0.52	0.71	Major Arterial
Vekol Valley Pkwy	Barnes Rd	Hassayampa Fwy	6.7	423,000	6	Pkwy	62,900	79,000	60,000	15,000	90,000	0.70	0.88	Major Arterial
Vekol Valley Pkwy	Hassayampa Fwy	SR-238	2.0	171,000	6	Pkwy	84,900	106,000	61,000	15,000	90,000	**0.94**	**1.18**	Parkway
Vekol Valley Pkwy	SR-238	Hassayampa Fwy	4.9	299,000	6	Pkwy	60,500	79,000	50,000	15,000	90,000	0.67	0.88	Parkway
Watermelon Rd	Paloma Rd	Citrus Valley Rd	4.9	418,000	4	Pkwy	85,400	122,000	53,000	15,000	60,000	**1.42**	**2.03**	Parkway
Watermelon Rd	Citrus Valley Rd	Gila Blvd	4.0	506,000	4	Pkwy	125,800	136,000	115,000	15,000	60,000	**2.10**	**2.27**	Parkway
Watermelon Rd	Gila Blvd	Hidden Waters Pkwy	2.8	296,000	4	Pkwy	105,400	132,000	93,000	15,000	60,000	**1.76**	**2.20**	Parkway
Warren Rd-Ralston Rd	Selma Hwy	Barnes Rd	2.5	122,000	6	Pkwy	48,800	81,000	33,000	15,000	90,000	0.54	**0.90**	Parkway
Warren Rd-Ralston Rd	Barnes Rd	Hassayampa Fwy	2.3	145,000	6	Pkwy	63,600	72,000	50,000	15,000	90,000	0.71	0.80	Parkway
Warren Rd-Ralston Rd	Hassyampa Fwy	SR-238	9.4	656,000	6	Pkwy	70,100	107,000	41,000	15,000	90,000	0.78	**1.19**	Parkway

EVALUATION OF MODEL RESULTS FOR TIER 2 ALTERNATIVES BY CORRIDOR: ALTERNATIVE B

Roadway	From	To	Length (Miles)	Vehicle Miles of Travel (VMT)	No. of Lanes	Roadway Type (Modeled)	Average Volume [1]	Highest Volume	Lowest Volume	Lane Capacity	Roadway Capacity	Average Volume-to-Capacity (*v/c*) Ratio [2]	Highest *v/c* Ratio [2]	Recommended Functional Classification
Anderson Rd	Interstate 8	SR-84	3.6	179,000	6	Pkwy	50,500	50,000	41,000	15,000	90,000	0.56	0.56	Parkway
Anderson Rd	SR-84	Kortsen Rd	2.0	97,000	6	Pkwy	49,200	78,000	37,000	15,000	90,000	0.55	0.87	Parkway
Anderson Rd	Kortsen Rd	Hassayampa Fwy	1.1	102,000	6	Pkwy	96,700	116,000	80,000	15,000	90,000	**1.07**	**1.29**	Parkway
Anderson Rd	Hassayampa Fwy	Maricopa-Casa Grande Hwy	3.5	200,000	6	Pkwy	57,100	71,000	48,000	15,000	90,000	0.63	0.79	Parkway
Countyline Pkwy	Hassayampa Fwy	SR-238	4.2	201,000	6	Pkwy	48,400	71,000	39,000	15,000	90,000	0.54	0.79	Parkway
Florence Blvd/SR-84/SR-287	Interstate 8	SR-347	5.8	164,000	4	Major Artterial	28,500	33,000	20,000	10,900	43,600	0.65	0.76	Major Arterial
Florence Blvd/SR-84/SR-287	SR-347	Montgomery Rd	11.0	313,000	4	Major Artterial	28,400	42,000	7,000	10,900	43,600	0.65	**0.96**	Major Arterial
Florence Blvd/SR-84/SR-287	Montgomery Rd	Pinal Ave (SR-387)	6.0	215,000	4	Major Artterial	35,800	47,000	25,000	10,900	43,600	0.82	**1.08**	Major Arterial
Florence Blvd/SR-84/SR-287	Pinal Ave (SR-387)	Interstate 10	4.0	200,000	4	Major Artterial	49,900	81,000	29,000	10,900	43,600	**1.14**	**1.86**	Major Arterial
Hassayampa Fwy	Picacho Vista Fwy	Interstate 10	16.5	2,022,000	6	Fwy	122,600	138,000	80,000	25,400	152,400	0.80	**0.91**	Freeway
Hassayampa Fwy	Interstate 10	Maricopa-Casa Grande Hwy	9.5	1,934,000	6	Fwy	202,900	239,000	94,000	25,400	152,400	**1.33**	**1.57**	Freeway
Hassayampa Fwy	Maricopa-Casa Grande Hwy	SR-347	10.5	1,883,000	6	Fwy	179,900	220,000	106,000	25,400	152,400	**1.18**	**1.44**	Freeway
Hassayampa Fwy	SR-347	SR-303S (303 Spur)	12.2	2,018,000	6	Fwy	165,000	190,000	121,000	25,400	152,400	**1.08**	**1.25**	Freeway
Hassayampa Fwy	SR-303S (303 Spur)	SR-303L	13.0	3,372,000	8	Fwy	259,500	304,000	168,000	25,400	203,200	**1.28**	**1.50**	Freeway
Hassayampa Fwy	SR-303L	SR-85	17.3	2,476,000	6	Fwy	142,900	157,000	108,000	25,400	152,400	**0.94**	**1.03**	Freeway
Hassayampa Fwy	SR-85	Southern Ave	16.5	1,646,000	6	Fwy	100,000	140,000	83,000	25,400	152,400	0.66	**0.92**	Freeway
Hassayampa Fwy	Southern Ave	Interstate 10	9.1	716,000	8	Fwy	78,800	83,000	78,000	25,400	203,200	0.39	0.41	Freeway
Hidden Waters Pkwy	Maricopa Scenic Way	Watermelon Rd	1.6	46,000	2	Pkwy	28,700	30,000	26,000	15,000	30,000	**0.96**	**1.00**	Parkway
Hidden Waters Pkwy	Watermelon Rd	Woods Rd	10.3	537,000	4	Pkwy	52,400	80,000	27,000	15,000	60,000	0.87	**1.33**	Parkway
Hidden Waters Pkwy	Woods Rd	Gillespie Dam	5.4	213,000	4	Pkwy	39,300	40,000	39,000	15,000	60,000	0.66	0.67	Parkway
Hidden Waters Pkwy	Gillespie Dam	SR-801	15.3	474,000	6	Pkwy	31,000	41,000	15,000	15,000	90,000	0.34	0.46	Parkway
Hidden Waters Pkwy	SR-801	Interstate 10	7.7	85,000	6	Pkwy	10,900	13,000	7,000	15,000	90,000	0.12	0.14	Parkway
Hidden Waters Pkwy (Hassayampa Model) [3]	Gillespe Dam	SR-801	15.3	720,000	6	Pkwy	47,100	58,000	42,000	15,000	90,000	0.52	0.64	Parkway
Hidden Waters Pkwy (Hassayampa Model) [3]	SR-801	Interstate 10	7.7	533,000	6	Pkwy	69,100	85,000	55,000	15,000	90,000	0.77	**0.94**	Parkway
Hombre de Agua	Cotton Lane	Sonoran Valley Pkwy	15.5	262,000	4	Major Artterial	16,900	39,000	7,000	10,900	43,600	0.39	0.89	Major Arterial
Interstate 8	Paloma Rd	SR-85	11.6	1,919,000	4	Fwy	165,900	198,000	104,000	25,400	101,600	**1.63**	**1.95**	Freeway
Interstate 8	SR-85	SR-303 Spur	28.4	3,371,000	4	Fwy	118,900	144,000	88,000	25,400	101,600	**1.17**	**1.42**	Freeway
Interstate 8	SR-303 Spur	SR-347	10.7	1,847,000	6	Fwy	172,700	184,000	159,000	25,400	152,400	**1.13**	**1.21**	Freeway
Interstate 8	SR-347	Anderson Rd	7.0	1,337,000	6	Fwy	192,000	203,000	182,000	25,400	152,400	**1.26**	**1.33**	Freeway
Interstate 8	Anderson Rd	Montgomery Rd	4.1	702,000	6	Fwy	172,700	180,000	139,000	25,400	152,400	**1.13**	**1.18**	Freeway
Interstate 8	Montgomery Rd	Trekell Rd	7.0	1,403,000	6	Fwy	201,100	220,000	180,000	25,400	152,400	**1.32**	**1.44**	Freeway
Interstate 8	Trekell Rd	Interstate 10	3.0	649,000	6	Fwy	220,100	219,000	163,000	25,400	152,400	**1.44**	**1.44**	Freeway
Interstate 10	Riggs Rd	Casa Blanca Rd	8.6	2,531,000	8	Fwy	294,300	305,000	241,000	25,400	203,200	**1.45**	**1.50**	Freeway
Interstate 10	Casa Blanca Rd	SR-387/Pinal Ave	9.2	2,609,000	8	Fwy	283,400	280,000	227,000	25,400	203,200	**1.39**	**1.38**	Freeway
Interstate 10	SR-387/Pinal Ave	Hassayampa Fwy	2.6	633,000	9	Fwy	239,800	243,000	227,000	25,400	228,600	**1.05**	**1.06**	Freeway
Interstate 10	Hassayampa Fwy	Kortsen Rd	4.9	629,000	8	Fwy	129,600	139,000	107,000	25,400	203,200	0.64	0.68	Freeway
Interstate 10	Kortsen Rd	Selma Hwy	4.1	536,000	8	Fwy	130,500	141,000	110,000	25,400	203,200	0.64	0.69	Freeway
Interstate 10	Selma Hwy	Interstate 8	2.1	268,000	8	Fwy	125,000	138,000	110,000	25,400	203,200	0.62	0.68	Freeway
Interstate 10	Interstate 8	Toltec Rd	5.3	1,176,000	8	Fwy	221,400	256,000	221,000	25,400	203,200	**1.09**	**1.26**	Freeway
Kortsen Rd	Vekol Valley Pkwy	SR-303S (303 Spur)	0.4	17,000	6	Pkwy	49,900	59,000	48,000	15,000	90,000	0.55	0.66	Major Arterial
Kortsen Rd	SR-303S (303 Spur)	Warren Rd	6.3	304,000	6	Pkwy	48,300	74,000	40,000	15,000	90,000	0.54	0.82	Major Arterial
Kortsen Rd	Warren Rd	SR-347	5.0	335,000	6	Pkwy	67,400	78,000	51,000	15,000	90,000	0.75	0.87	Parkway
Kortsen Rd	SR-347	Anderson Rd	7.0	463,000	6	Pkwy	66,200	83,000	51,000	15,000	90,000	0.74	**0.92**	Parkway
Kortsen Rd	Anderson Rd	Montgomery Rd	4.4	253,000	6	Pkwy	58,100	77,000	45,000	15,000	90,000	0.65	0.86	Parkway
Kortsen Rd	Montgomery Rd	Pinal Ave (SR-387)	5.7	366,000	6	Pkwy	63,800	83,000	51,000	15,000	90,000	0.71	**0.92**	Parkway
Kortsen Rd	Pinal Ave (SR-387)	Interstate 10	3.9	251,000	6	Pkwy	63,900	86,000	48,000	15,000	90,000	0.71	**0.96**	Parkway
Montgomery Rd	Interstate 8	Kortsen Rd	5.3	847,000	6	Fwy	159,100	166,000	127,000	25,400	152,400	**1.04**	**1.09**	Freeway
Montgomery Rd	Kortsen Rd	Hassayampa Fwy	3.6	588,000	6	Fwy	163,500	172,000	133,000	25,400	152,400	**1.07**	**1.13**	Freeway

EVALUATION OF MODEL RESULTS FOR TIER 2 ALTERNATIVES BY CORRIDOR: ALTERNATIVE B (CONTINUED)

Roadway	From	To	Length (Miles)	Vehicle Miles of Travel (VMT)	No. of Lanes	Roadway Type (Modeled)	Average Volume [1]	Highest Volume	Lowest Volume	Lane Capacity	Roadway Capacity	Average Volume-to-Capacity (*v/c*) Ratio [2]	Highest *v/c* Ratio [2]	Recommended Functional Classification
North-East Maricopa Loop	Maricopa-Casa Grande Hwy	Honeycutt Rd	4.0	244,000	6	Pkwy	61,200	71,000	51,000	15,000	90,000	0.68	0.79	Parkway
North-East Maricopa Loop	Honeycutt Rd	SR-238/SR-347	7.1	311,000	6	Pkwy	43,700	74,000	28,000	15,000	90,000	0.49	0.82	Parkway
Sonoran Valley-Rainbow Valley Rds	SR-238	Casa Blanca Rd	3.2	243,000	6	Pkwy	75,400	76,000	75,000	15,000	90,000	0.84	0.84	Parkway
Sonoran Valley-Rainbow Valley Rds	Casa Blanca Rd	Dysart Rd	2.1	172,000	8	Pkwy	80,300	82,000	77,000	15,000	120,000	0.67	0.68	Parkway
Sonoran Valley-Rainbow Valley Rds	Dysart Rd	Hassayampa Fwy	9.0	291,000	6	Pkwy	32,500	64,000	7,000	15,000	90,000	0.36	0.71	Parkway
Sonoran Valley-Rainbow Valley Rds	Hassayampa Fwy	Queen Creek Rd	2.4	104,000	8	Pkwy	44,100	55,000	35,000	15,000	120,000	0.37	0.46	Parkway
Sonoran Valley-Rainbow Valley Rds	Queen Creek Rd	SR-303L	6.1	294,000	6	Pkwy	47,900	78,000	56,000	15,000	90,000	0.53	0.87	Parkway
SR-85 Freeway	Interstate 8	Maricopa Scenic Way	1.8	201,000	4	Fwy	109,800	153,000	116,000	25,400	101,600	**1.08**	**1.51**	Freeway
SR-85 Freeway	Maricopa Scenic Way	Hassayampa Fwy	20.1	3,002,000	4	Fwy	149,100	170,000	124,000	25,400	101,600	**1.47**	**1.67**	Freeway
SR-85 Freeway	Hassayampa Fwy	SR-801	8.5	1,396,000	6	Fwy	164,500	169,000	109,000	25,400	152,400	**1.08**	**1.11**	Freeway
SR-85 Freeway	SR-801	Interstate 10	4.4	497,000	8	Fwy	112,000	127,000	91,000	25,400	203,200	0.55	0.63	Freeway
SR-238	Sonoran Valley Pkwy	Hassayampa Fwy	1.1	64,000	6	Pkwy	56,900	60,000	56,000	15,000	90,000	0.63	0.67	Parkway
SR-238	Hassayampa Fwy	Vekol Valley Pkwy	2.1	221,000	6	Fwy	103,400	111,000	79,000	25,400	152,400	0.68	0.73	Freeway
SR-238	Vekol Valley Pkwy	Countyline Pkwy	2.1	273,000	6	Fwy	127,300	130,000	91,000	25,400	152,400	0.84	0.85	Freeway
SR-238	Countyline Pkwy	Warren Rd	3.9	627,000	6	Fwy	161,100	162,000	120,000	25,400	152,400	**1.06**	**1.06**	Freeway
SR-238	Warren Rd	SR-347	4.2	896,000	6	Fwy	215,600	261,000	136,000	25,400	152,400	**1.41**	**1.71**	Freeway
SR-238	SR-347	White and Parker Rd	4.0	589,000	6	Fwy	147,100	161,000	126,000	25,400	152,400	**0.97**	**1.06**	Freeway
SR-238	White and Parker Rd	Anderson Rd	4.6	794,000	6	Fwy	171,400	191,000	139,000	25,400	152,400	**1.12**	**1.25**	Freeway
SR-238	Anderson Rd	Hassayampa Fwy	3.0	574,000	6	Fwy	193,800	209,000	174,000	25,400	152,400	**1.27**	**1.37**	Freeway
SR-303L (Estrella Fwy Extension)	Hassayampa Fwy	Cotton Lane	9.5	1,378,000	8	Fwy	145,800	170,000	120,000	25,400	203,200	0.72	0.84	Freeway
SR-303L (Estrella Fwy Extension)	Cotton Lane	SR-801	12.2	2,795,000	8	Fwy	229,200	294,000	145,000	25,400	203,200	**1.13**	**1.45**	Freeway
SR-303L (Estrella Fwy Extension)	SR-801	Interstate 10	4.7	793,000	8	Fwy	168,300	204,000	94,000	25,400	203,200	0.83	**1.00**	Freeway
SR-303S (303 Spur)	Interstate 8	Hassayampa Fwy	11.9	1,413,000	4	Fwy	118,300	135,000	77,000	25,400	101,600	**1.16**	**1.33**	Freeway
SR-347	Interstate 8	SR-84	2.9	157,000	6	Pkwy	54,200	61,000	46,000	15,000	90,000	0.60	0.68	Parkway
SR-347	SR-84	Barnes Rd	2.8	164,000	6	Pkwy	59,100	79,000	36,000	15,000	90,000	0.66	0.88	Parkway
SR-347	Barnes Rd	Hassayampa Fwy	0.5	40,000	6	Pkwy	87,600	88,000	72,000	15,000	90,000	**0.97**	**0.98**	Parkway
SR-347	Hassayampa Fwy	Val Vista Rd	2.7	179,000	6	Major Artterial	66,700	85,000	52,000	10,900	65,400	**1.02**	**1.30**	Parkway
SR-347	Val Vista Rd	Farrell Rd	4.6	275,000	6	Major Artterial	59,700	70,000	51,000	10,900	65,400	**0.91**	**1.07**	Parkway
SR-347	Farrell Rd	Maricopa-Casa Grande Hwy	2.0	87,000	6	Major Artterial	43,000	65,000	39,000	10,900	65,400	0.66	**0.99**	Parkway
SR-347	Maricopa-Casa Grande Hwy	SR-238	1.0	35,000	6	Major Artterial	33,900	36,000	31,000	10,900	65,400	0.52	0.55	Parkway
SR-347	SR-238	Hiller Rd	1.1	68,000	6	Major Artterial	60,600	62,000	60,000	10,900	65,400	**0.93**	**0.95**	Parkway
SR-347	Hiller Rd	Riggs Rd	9.6	868,000	6	Major Artterial	90,300	94,000	81,000	10,900	65,400	**1.38**	**1.44**	Parkway
Vekol Valley Pkwy	Interstate 8	Peters Rd	3.2	65,000	6	Pkwy	20,500	26,000	11,000	15,000	90,000	0.23	0.29	Major Arterial
Vekol Valley Pkwy	Peters Rd	Barnes Rd	6.2	279,000	6	Pkwy	44,700	64,000	28,000	15,000	90,000	0.50	0.71	Major Arterial
Vekol Valley Pkwy	Barnes Rd	Hassayampa Fwy	6.7	427,000	6	Pkwy	63,400	81,000	59,000	15,000	90,000	0.70	**0.90**	Major Arterial
Vekol Valley Pkwy	Hassayampa Fwy	SR-238	1.7	153,000	6	Pkwy	91,900	109,000	69,000	15,000	90,000	**1.02**	**1.21**	Parkway
Vekol Valley Pkwy	SR-238	Hassayampa Fwy	4.3	245,000	6	Pkwy	57,500	77,000	45,000	15,000	90,000	0.64	0.86	Parkway
Watermelon Rd	Paloma Rd	Citrus Valley Rd	4.9	422,000	4	Pkwy	86,200	123,000	54,000	15,000	60,000	**1.44**	**2.05**	Parkway
Watermelon Rd	Citrus Valley Rd	Gila Blvd	4.0	506,000	4	Pkwy	125,800	135,000	116,000	15,000	60,000	**2.10**	**2.25**	Parkway
Watermelon Rd	Gila Blvd	Hidden Waters Pkwy	2.8	294,000	4	Pkwy	104,800	132,000	92,000	15,000	60,000	**1.75**	**2.20**	Parkway
Warren Rd-Ralston Rd	Selma Hwy	Barnes Rd	2.5	109,000	6	Pkwy	43,400	80,000	31,000	15,000	90,000	0.48	0.89	Parkway
Warren Rd-Ralston Rd	Barnes Rd	Hassayampa Fwy	2.3	143,000	6	Pkwy	62,800	77,000	49,000	15,000	90,000	0.70	0.86	Parkway
Warren Rd-Ralston Rd	Hassyampa Fwy	SR-238	9.0	598,000	6	Pkwy	66,600	99,000	41,000	15,000	90,000	0.74	**1.10**	Parkway

EVALUATION OF MODEL RESULTS FOR TIER 2 ALTERNATIVES BY CORRIDOR: ALTERNATIVE C2

Roadway	From	To	Length (Miles)	Vehicle Miles of Travel (VMT)	No. of Lanes	Roadway Type (Modeled)	Average Volume [1]	Highest Volume	Lowest Volume	Lane Capacity	Roadway Capacity	Average Volume-to-Capacity (*v/c*) Ratio [2]	Highest *v/c* Ratio [2]	Recommended Functional Classification
Anderson Rd	Interstate 8	SR-84	3.6	196,000	6	Pkwy	55,100	53,000	44,000	15,000	90,000	0.61	0.59	Parkway
Anderson Rd	SR-84	Kortsen Rd	2.0	106,000	6	Pkwy	53,600	79,000	43,000	15,000	90,000	0.60	0.88	Parkway
Anderson Rd	Kortsen Rd	Hassayampa Fwy	1.1	103,000	6	Pkwy	97,700	116,000	81,000	15,000	90,000	**1.09**	**1.29**	Parkway
Anderson Rd	Hassayampa Fwy	Maricopa-Casa Grande Hwy	4.2	340,000	6	Pkwy	81,500	100,000	62,000	15,000	90,000	**0.91**	**1.11**	Parkway
Countyline Pkwy	Hassayampa Fwy	SR-238	4.7	205,000	6	Pkwy	43,500	73,000	19,000	15,000	90,000	0.48	0.81	Parkway
Florence Blvd/SR-84/SR-287	Interstate 8	SR-347	5.8	184,000	4	Major Arterial	31,800	38,000	20,000	10,900	43,600	0.73	0.87	Major Arterial
Florence Blvd/SR-84/SR-287	SR-347	Montgomery Rd	11.0	322,000	4	Major Arterial	29,200	43,000	6,000	10,900	43,600	0.67	**0.99**	Major Arterial
Florence Blvd/SR-84/SR-287	Montgomery Rd	Pinal Ave (SR-387)	6.0	213,000	4	Major Arterial	35,400	46,000	25,000	10,900	43,600	0.81	**1.06**	Major Arterial
Florence Blvd/SR-84/SR-287	Pinal Ave (SR-387)	Interstate 10	4.0	199,000	4	Major Arterial	49,800	81,000	29,000	10,900	43,600	**1.14**	**1.86**	Major Arterial
Hassayampa Fwy	Picacho Vista Fwy	Interstate 10	16.5	1,932,000	6	Fwy	117,200	161,000	84,000	25,400	152,400	0.77	**1.06**	Freeway
Hassayampa Fwy	Interstate 10	Maricopa-Casa Grande Hwy	9.5	1,843,000	6	Fwy	193,500	211,000	94,000	25,400	152,400	**1.27**	**1.38**	Freeway
Hassayampa Fwy	Maricopa-Casa Grande Hwy	SR-347	10.5	2,039,000	6	Fwy	194,700	233,000	142,000	25,400	152,400	**1.28**	**1.53**	Freeway
Hassayampa Fwy	SR-347	SR-303S (303 Spur)	12.2	2,464,000	6	Fwy	201,500	216,000	160,000	25,400	152,400	**1.32**	**1.42**	Freeway
Hassayampa Fwy	SR-303S (303 Spur)	SR-303L	13.0	3,154,000	8	Fwy	242,700	295,000	131,000	25,400	203,200	**1.19**	**1.45**	Freeway
Hassayampa Fwy	SR-303L	SR-85	17.3	2,309,000	6	Fwy	133,300	146,000	100,000	25,400	152,400	0.87	**0.96**	Freeway
Hassayampa Fwy	SR-85	Southern Ave	19.4	1,685,000	6	Fwy	86,700	130,000	71,000	25,400	152,400	0.57	0.85	Freeway
Hassayampa Fwy	Southern Ave	Interstate 10	6.1	379,000	8	Fwy	62,100	72,000	66,000	25,400	203,200	0.31	0.35	Freeway
Hidden Waters Pkwy	Maricopa Scenic Way	Watermelon Rd	1.6	46,000	2	Pkwy	28,900	30,000	25,000	15,000	30,000	**0.96**	**1.00**	Parkway
Hidden Waters Pkwy	Watermelon Rd	Woods Rd	10.3	540,000	4	Pkwy	52,600	81,000	27,000	15,000	60,000	0.88	**1.35**	Parkway
Hidden Waters Pkwy	Woods Rd	Gillespie Dam	5.4	214,000	4	Pkwy	39,500	40,000	39,000	15,000	60,000	0.66	0.67	Parkway
Hidden Waters Pkwy	Gillespie Dam	SR-801	15.3	471,000	6	Pkwy	30,800	41,000	22,000	15,000	90,000	0.34	0.46	Parkway
Hidden Waters Pkwy	SR-801	Interstate 10	7.7	83,000	6	Pkwy	10,700	14,000	6,000	15,000	90,000	0.12	0.16	Parkway
Hidden Waters Pkwy (Hassayampa Model) [3]	Gillespe Dam	SR-801	15.3	720,000	6	Pkwy	47,100	58,000	42,000	15,000	90,000	0.52	0.64	Parkway
Hidden Waters Pkwy (Hassayampa Model) [3]	SR-801	Interstate 10	7.7	533,000	6	Pkwy	69,100	85,000	55,000	15,000	90,000	0.77	**0.94**	Parkway
Hombre de Agua	Cotton Lane	Sonoran Valley Pkwy	15.5	490,000	6	Pkwy	31,600	62,000	18,000	15,000	90,000	0.35	0.69	Major Arterial
Interstate 8	Paloma Rd	SR-85	11.6	1,919,000	4	Fwy	165,900	198,000	71,000	25,400	101,600	**1.63**	**1.95**	Freeway
Interstate 8	SR-85	SR-303 Spur	28.4	3,402,000	4	Fwy	120,000	144,000	96,000	25,400	101,600	**1.18**	**1.42**	Freeway
Interstate 8	SR-303 Spur	SR-347	10.7	1,717,000	6	Fwy	160,600	176,000	144,000	25,400	152,400	**1.05**	**1.15**	Freeway
Interstate 8	SR-347	Anderson Rd	7.0	1,329,000	6	Fwy	190,800	203,000	158,000	25,400	152,400	**1.25**	**1.33**	Freeway
Interstate 8	Anderson Rd	Montgomery Rd	4.1	674,000	6	Fwy	165,800	175,000	129,000	25,400	152,400	**1.09**	**1.15**	Freeway
Interstate 8	Montgomery Rd	Trekell Rd	7.0	1,356,000	6	Fwy	194,500	213,000	129,000	25,400	152,400	**1.28**	**1.40**	Freeway
Interstate 8	Trekell Rd	Interstate 10	3.0	624,000	6	Fwy	211,600	211,000	174,000	25,400	152,400	**1.39**	**1.38**	Freeway
Interstate 10	Riggs Rd	Casa Blanca Rd	8.6	2,543,000	8	Fwy	295,800	306,000	241,000	25,400	203,200	**1.46**	**1.51**	Freeway
Interstate 10	Casa Blanca Rd	SR-387/Pinal Ave	9.2	2,636,000	8	Fwy	286,400	287,000	231,000	25,400	203,200	**1.41**	**1.41**	Freeway
Interstate 10	SR-387/Pinal Ave	Hassayampa Fwy	2.6	641,000	9	Fwy	243,000	246,000	231,000	25,400	228,600	**1.06**	**1.08**	Freeway
Interstate 10	Hassayampa Fwy	Kortsen Rd	4.9	662,000	8	Fwy	136,400	147,000	115,000	25,400	203,200	0.67	0.72	Freeway
Interstate 10	Kortsen Rd	Selma Hwy	4.1	569,000	8	Fwy	138,500	148,000	118,000	25,400	203,200	0.68	0.73	Freeway
Interstate 10	Selma Hwy	Interstate 8	2.1	284,000	8	Fwy	132,400	144,000	116,000	25,400	203,200	0.65	0.71	Freeway
Interstate 10	Interstate 8	Toltec Rd	5.3	1,165,000	8	Fwy	219,400	253,000	217,000	25,400	203,200	**1.08**	**1.25**	Freeway
Kortsen Rd	Vekol Valley Pkwy	SR-303S (303 Spur)	0.3	18,000	6	Pkwy	53,400	58,000	58,000	15,000	90,000	0.59	0.64	Major Arterial
Kortsen Rd	SR-303S (303 Spur)	Warren Rd	6.3	283,000	6	Pkwy	44,600	74,000	30,000	15,000	90,000	0.50	0.82	Major Arterial
Kortsen Rd	Warren Rd	SR-347	5.0	355,000	6	Pkwy	71,600	79,000	56,000	15,000	90,000	0.80	0.88	Parkway
Kortsen Rd	SR-347	Anderson Rd	7.0	491,000	6	Pkwy	70,100	87,000	52,000	15,000	90,000	0.78	**0.97**	Parkway
Kortsen Rd	Anderson Rd	Montgomery Rd	4.4	256,000	6	Pkwy	58,800	74,000	47,000	15,000	90,000	0.65	0.82	Parkway
Kortsen Rd	Montgomery Rd	Pinal Ave (SR-387)	5.7	362,000	6	Pkwy	63,100	83,000	50,000	15,000	90,000	0.70	**0.92**	Parkway
Kortsen Rd	Pinal Ave (SR-387)	Interstate 10	3.9	251,000	6	Pkwy	63,800	86,000	47,000	15,000	90,000	0.71	**0.96**	Parkway
Montgomery Rd	Interstate 8	Kortsen Rd	5.3	888,000	6	Fwy	167,000	173,000	135,000	25,400	152,400	**1.10**	**1.14**	Freeway
Montgomery Rd	Kortsen Rd	Hassayampa Fwy	3.6	598,000	6	Fwy	166,400	176,000	136,000	25,400	152,400	**1.09**	**1.15**	Freeway

EVALUATION OF MODEL RESULTS FOR TIER 2 ALTERNATIVES BY CORRIDOR: ALTERNATIVE C2 (CONTINUED)

Roadway	From	To	Length (Miles)	Vehicle Miles of Travel (VMT)	No. of Lanes	Roadway Type (Modeled)	Average Volume (1)	Highest Volume	Lowest Volume	Lane Capacity	Roadway Capacity	Average Volume-to-Capacity (v/c) Ratio (2)	Highest v/c Ratio (2)	Recommended Functional Classification
North-East Maricopa Loop	Maricopa-Casa Grande Hwy	Honeycutt Rd	4.1	248,000	6	Pkwy	60,900	72,000	52,000	15,000	90,000	0.68	0.80	Parkway
North-East Maricopa Loop	Honeycutt Rd	SR-238/SR-347	7.1	384,000	6	Pkwy	54,000	65,000	29,000	15,000	90,000	0.60	0.72	Parkway
Sonoran Valley-Rainbow Valley Rds	SR-238	Casa Blanca Rd	3.2	235,000	6	Pkwy	72,900	75,000	71,000	15,000	90,000	0.81	0.83	Parkway
Sonoran Valley-Rainbow Valley Rds	Casa Blanca Rd	Dysart Rd	2.1	171,000	8	Pkwy	79,900	81,000	77,000	15,000	120,000	0.67	0.68	Parkway
Sonoran Valley-Rainbow Valley Rds	Dysart Rd	Hassayampa Fwy	9.0	236,000	6	Pkwy	26,400	46,000	5,000	15,000	90,000	0.29	0.51	Parkway
Sonoran Valley-Rainbow Valley Rds	Hassayampa Fwy	Queen Creek Rd	2.4	105,000	6	Pkwy	44,500	57,000	36,000	15,000	90,000	0.49	0.63	Parkway
Sonoran Valley-Rainbow Valley Rds	Queen Creek Rd	SR-303L	6.1	292,000	6	Pkwy	47,600	78,000	56,000	15,000	90,000	0.53	0.87	Parkway
SR-85 Freeway	Interstate 8	Maricopa Scenic Way	1.8	205,000	4	Fwy	112,100	158,000	35,000	25,400	101,600	**1.10**	**1.56**	Freeway
SR-85 Freeway	Maricopa Scenic Way	Hassayampa Fwy	20.1	3,004,000	4	Fwy	149,300	170,000	118,000	25,400	101,600	**1.47**	**1.67**	Freeway
SR-85 Freeway	Hassayampa Fwy	SR-801	8.5	1,398,000	6	Fwy	164,800	168,000	107,000	25,400	152,400	**1.08**	**1.10**	Freeway
SR-85 Freeway	SR-801	Interstate 10	4.4	489,000	8	Fwy	110,200	124,000	89,000	25,400	203,200	0.54	0.61	Freeway
SR-238	Sonoran Valley Pkwy	Hassayampa Fwy	1.2	72,000	6	Pkwy	60,900	65,000	61,000	15,000	90,000	0.68	0.72	Parkway
SR-238	Hassayampa Fwy	Vekol Valley Pkwy	2.0	109,000	6	Pkwy	55,100	65,000	48,000	15,000	90,000	0.61	0.72	Parkway
SR-238	Vekol Valley Pkwy	Countyline Pkwy	2.2	108,000	6	Pkwy	50,200	64,000	38,000	15,000	90,000	0.56	0.71	Parkway
SR-238	Countyline Pkwy	Warren Rd	3.9	223,000	6	Pkwy	56,700	62,000	51,000	15,000	90,000	0.63	0.69	Parkway
SR-238	Warren Rd	SR-347	5.3	583,000	6	Pkwy	109,700	177,000	65,000	15,000	90,000	**1.22**	**1.97**	Parkway
SR-238	SR-347	White and Parker Rd	3.5	146,000	6	Pkwy	41,700	38,000	38,000	15,000	90,000	0.46	0.42	Parkway
SR-238	White and Parker Rd	Anderson Rd	5.1	403,000	6	Major Arterial	79,600	94,000	53,000	10,900	65,400	**1.22**	**1.44**	Parkway
SR-238	Anderson Rd	Hassayampa Fwy	3.0	212,000	4	Major Arterial	69,900	87,000	53,000	10,900	43,600	**1.60**	**2.00**	Parkway
SR-303L (Estrella Fwy Extension)	Hassayampa Fwy	Cotton Lane	9.5	1,370,000	8	Fwy	145,000	169,000	125,000	25,400	203,200	0.71	0.83	Freeway
SR-303L (Estrella Fwy Extension)	Cotton Lane	SR-801	12.2	2,813,000	8	Fwy	230,600	295,000	144,000	25,400	203,200	**1.13**	**1.45**	Freeway
SR-303L (Estrella Fwy Extension)	SR-801	Interstate 10	4.7	786,000	8	Fwy	166,900	203,000	92,000	25,400	203,200	0.82	**1.00**	Freeway
SR-303S (303 Spur)	Interstate 8	Hassayampa Fwy	11.9	620,000	4	Pkwy	52,200	47,000	24,000	15,000	60,000	0.87	0.78	Parkway
SR-347	Interstate 8	SR-84	2.9	182,000	6	Pkwy	63,100	67,000	49,000	15,000	90,000	0.70	0.74	Parkway
SR-347	SR-84	Barnes Rd	2.8	181,000	6	Pkwy	65,400	84,000	43,000	15,000	90,000	0.73	**0.93**	Parkway
SR-347	Barnes Rd	Hassayampa Fwy	0.5	42,000	6	Pkwy	91,300	92,000	76,000	15,000	90,000	**1.01**	**1.02**	Parkway
SR-347	Hassayampa Fwy	Val Vista Rd	2.7	226,000	6	Major Arterial	84,100	106,000	68,000	10,900	65,400	**1.29**	**1.62**	Parkway
SR-347	Val Vista Rd	Farrell Rd	4.6	358,000	6	Major Arterial	77,600	97,000	56,000	10,900	65,400	**1.19**	**1.48**	Parkway
SR-347	Farrell Rd	Maricopa-Casa Grande Hwy	2.0	84,000	6	Major Arterial	43,300	45,000	39,000	10,900	65,400	0.66	0.69	Parkway
SR-347	Maricopa-Casa Grande Hwy	SR-238	1.0	66,000	6	Major Arterial	63,500	63,000	60,000	10,900	65,400	**0.97**	**0.96**	Parkway
SR-347	SR-238	Hiller Rd	1.1	71,000	6	Major Arterial	63,100	70,000	57,000	10,900	65,400	**0.96**	**1.07**	Parkway
SR-347	Hiller Rd	Riggs Rd	9.6	896,000	6	Major Arterial	93,200	95,000	86,000	10,900	65,400	**1.43**	**1.45**	Parkway
Vekol Valley Pkwy	Interstate 8	Peters Rd	3.2	143,000	6	Pkwy	45,200	54,000	41,000	15,000	90,000	0.50	0.60	Major Arterial
Vekol Valley Pkwy	Peters Rd	Barnes Rd	6.2	347,000	6	Pkwy	55,600	68,000	44,000	15,000	90,000	0.62	0.76	Major Arterial
Vekol Valley Pkwy	Barnes Rd	Hassayampa Fwy	6.7	477,000	6	Pkwy	70,900	81,000	66,000	15,000	90,000	0.79	**0.90**	Major Arterial
Vekol Valley Pkwy	Hassayampa Fwy	SR-238	2.0	156,000	6	Pkwy	77,400	95,000	56,000	15,000	90,000	0.86	**1.06**	Parkway
Vekol Valley Pkwy	SR-238	Hassayampa Fwy	4.9	297,000	6	Pkwy	60,300	79,000	50,000	15,000	90,000	0.67	0.88	Parkway
Watermelon Rd	Paloma Rd	Citrus Valley Rd	4.9	423,000	4	Pkwy	86,400	124,000	53,000	15,000	60,000	**1.44**	**2.07**	Parkway
Watermelon Rd	Citrus Valley Rd	Gila Blvd	4.0	506,000	4	Pkwy	125,900	136,000	115,000	15,000	60,000	**2.10**	**2.27**	Parkway
Watermelon Rd	Gila Blvd	Hidden Waters Pkwy	2.8	297,000	4	Pkwy	105,700	132,000	94,000	15,000	60,000	**1.76**	**2.20**	Parkway
Warren Rd-Ralston Rd	Selma Hwy	Barnes Rd	2.5	150,000	6	Pkwy	59,800	90,000	50,000	15,000	90,000	0.66	**1.00**	Parkway
Warren Rd-Ralston Rd	Barnes Rd	Hassayampa Fwy	2.3	159,000	6	Pkwy	69,600	79,000	52,000	15,000	90,000	0.77	0.88	Parkway
Warren Rd-Ralston Rd	Hassyampa Fwy	SR-238	9.4	679,000	6	Pkwy	72,500	112,000	42,000	15,000	90,000	0.81	**1.24**	Parkway

Prepared by: Wilson & Company, 12/10/08; Rvsd 04/16/09.

Notes:

1. Average volume on a Roadway Segment is calculated by dividing total VMT by the length of the Roadway Segment.
2. **Red** indicates the Segment Volume-to-Capacity (v/c) Ratio equals or exceeds 0.90 and is LOS E or Worse.
3. Buildout Daily Volume Estimates for these two Roadway Segments of Hiddenwaters Parkway within the I-10/Hassayampa Valley Transportation Framework Study Area are based on Hassayampa Valley Builout Volumes on Framework Network (both Hidden and Hassayampa F/W), dated: 9/30/08.

Source: Enhanced Hidden Valley Buildout Travel Demand Model, Maricopa Association of Governments, November 11, 2008.

Interstate 8 and Interstate 10
Hidden Valley Transportation Framework Study

Chapter 5

Evaluation Framework and Transportation Network Alternatives

August 2009

Prepared for

MARICOPA ASSOCIATION of GOVERNMENTS

Prepared by

AECOM

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5.1 Evaluation Framework

5.1.1 Goals

The evaluation criteria for roadway network alternatives in the I-8 and I-10 Hidden Valley study area are designed to meet the following goals, which the MAG study team developed in collaboration with the Funding Partners and Study Review Team:

- *Safety:* Develop and maintain a safe transportation system for all users.
- *Mobility:* Provide for the rapid and efficient movement of people and goods within the study area, as well as between the study area and other portions of the region and the state.
- *Access:* Provide access to high-capacity roadways for study area residents, businesses, and activity centers, including mixed-use centers.
- *Planning Consistency:* Ensure that the recommended roadway network is consistent with established local plans, whether public or private.
- *Environmental Compatibility:* Develop a transportation system that avoids undue disturbance of the natural, physical, and human environment.
- *Economic Benefit:* Recommend an alternative that maximizes economic gain in the study area.
- *Cost:* Minimize the overall cost of the roadway network.
- *Ease of Implementation:* Recommend an alternative (concept plan) that can be implemented with minimal opposition from stakeholders, and without undue legal or institutional obstacles.
- *Cost/Benefit:* Minimize the cost per unit of user benefit (i.e., vehicle miles of travel).

5.1.2 Evaluation Criteria and Performance Objectives

Table 5.1 lists the evaluation criteria and performance objectives associated with each goal. The evaluation criteria are designed to measure the expected attainment of various aspects of a particular goal. The number of criteria per goal ranges from one to six. This variation reflects both the inherent complexity of each goal and the amount of data available for use in making informed judgments. For example, the MAG model generates numerous measures of effectiveness that can be used to evaluate mobility (and safety) quantitatively. Mobility is also a broadly defined goal that can be approached in many ways.

Each evaluation criterion has at least one associated performance objective, and each objective consists of minimizing or maximizing an outcome that reflects fulfillment of the criterion and attainment of the related goal. Many of the objectives are measurable numerically. These are the easiest to apply because they require the least exercise of professional judgment in comparing alternatives. The entire safety and mobility evaluation uses quantitative model outputs, or measures of effectiveness derived from these outputs, such as vehicle miles and vehicle hours of travel (VMT and VHT), travel speed, and volume to capacity ratio. (Level of service is estimated using methods from the current edition of the *Highway Capacity Manual*, published by the Transportation Research Board Committee on Highway Capacity and Quality of Service.) The last two mobility criteria used a series of strategically placed east-west and north-south "cut-lines." These cut-lines are useful in comparing travel demand with roadway capacity, within a broad band comprising several parallel arterials and higher-level facilities. Chapter 4 further explains the cut-line concept and its application.

The access, cost, and cost/benefit portions of the evaluation are also based at least partly on quantitative data. Planning consistency, environmental compatibility, economic benefit, and ease of implementation, on the other hand, are evaluated in a more subjective manner that relies heavily of the MAG study team's professional judgment and knowledge accumulated during this study.

Table 5.1 Evaluation Criteria and Performance Objectives

Goals	Evaluation Criteria	Performance Objectives
Safety*	Intensity of roadway system use	Minimize daily VMT per lane mile in the study area.
	Proportion of travel on the safest facilities	Maximize the percent of daily VMT on freeways.
Mobility*	Prevalence of freeway congestion	Minimize the (daily) percent of freeway lane miles operating at Level of Service E or F.
	Prevalence of systemwide congestion	Minimize the (daily) percent of lane miles on all facilities operating at LOS E or F.^
	East-west traffic flow and directional network capacity	Minimize the percent of congested (LOS E or F) daily VMT.
		Minimize the number of facilities with (daily) LOS of E or F across all designated cut-lines.
		Minimize the volume/capacity (V/C) ratio across all designated north-south cut-lines.^
	North-south traffic flow and directional network capacity	Minimize the V/C ratio across all designated east-west cut-lines.
Access	Residential access to freeways	Maximize the percent of study area residents within two miles of a (local service) freeway interchange.
	Employment access to freeways	Maximize the percent of study area employment within two miles of a (local service) freeway interchange.
Planning Consistency	Municipal/county transportation planning	Maximize circulation planning consistency.
	Public land use and economic development planning	Maximize consistency with jurisdictional land use and economic development plans.

Table 5.1 - Continued

Goals	Evaluation Criteria	Performance Objectives
Environmental Compatibility	Flood control structure impacts	Minimize impacts to existing canals and flood control structures.
	Floodplain and drainage impacts	Minimize impacts associated with crossing of floodplains or disturbance of drainage features, including Waters of the U.S. under jurisdiction of the U.S. Army Corps of Engineers.
	Impacts to public recreational land	Minimize impacts to resources protected under Section 4(f) or 6(f)
	Impacts to sensitive habitats and species	Minimize impacts to areas containing known or likely habitat for Threatened, Endangered and other sensitive species.
	Wildlife movement impacts	Minimize impacts to wildlife corridors.
	Air quality and fuel conservation	Minimize daily VMT in the study area.
Economic Benefit	Positive impact on regional and local economic development	Maximize the expected gain from economic development likely to occur within the region in response to implementation.^
Cost	Construction cost	Minimize capital cost.
	Cost of maintaining transportation infrastructure	Minimize operating and maintenance cost.
	Land acquisition cost	Minimize right-of-way cost.
Ease of Implementation	Funding Partners' and SRT support	Obtain strong support from the Study Review Team & Funding Partners.
	Stakeholder and community acceptance	Maximize the likelihood of acceptance by outside agencies, stakeholders & the community.
	Miscellaneous constraints	Minimize any legal or institutional barriers that may make one alternative harder to implement than others.
Cost/Benefit	Generalized ratio of cost to benefit	Minimize "planning-level" capital cost per VMT accommodated.

*Used in Tier 1. Other criteria were used only in Tier 2.
^Not used previously in MAG Hassayampa Valley study.

Source: MAG study team, June 2009

5.1.3 Limitations

Some evaluation criteria are not listed in Table 5.1 because the data necessary to conduct an evaluation does not currently exist. For example, environmental justice – the degree to which an alternative avoids disproportionate impacts to certain minorities and disadvantaged groups – is an important component of environmental compatibility. However, much of the Hidden Valley study area is currently sparsely settled, outside the concentrated population centers of Maricopa and Casa Grande. Therefore, the demographic composition of the larger future population is unknown. Impacts on cultural resources cannot be assessed because the specific locations of archaeological sites are protected by federal and state laws to prevent vandalism of these resources.

5.2 Description of Alternative Transportation Networks

In response to the extensive community involvement process described in Chapter 2, the MAG study team developed and continually refined a network of roadways and transit alternatives to provide mobility to, from, and within the Hidden Valley study area under Buildout conditions (year 2050 or beyond). In Maricopa County, this network was designed to address the deficiencies identified when the existing plus committed (MAG Regional Transportation Plan) year 2026 roadway system was used as the background network for an unconstrained traffic assignment. On the Pinal County side, the modeling network from the recently completed *Regionally Significant Routes for Safety and Mobility Plan* (RSRSM) was used to estimate travel demand. Together, these MAG and Pinal County resources were used to create a refined Hidden Valley network and transportation demand model. The socioeconomic (population, housing, and employment) inputs to the model were based on the latest Buildout projections supplied by jurisdictions within the study area, on adopted year 2030 projections for the rest of Maricopa County (outside the study area), and on preliminary 2030 projections for the remainder of Pinal County. Chapter 4 provides details of the modeling and traffic forecasting process.

5.2.1 Alternative A (Base)

Alternative A is the "base" roadway network originally designed to serve the Hidden Valley study area under Buildout conditions. As illustrated in Figure 5-1, the map shows three types of roadways: freeways, arterial streets, and an intermediate facility called an Arizona parkway, designed to provide greater capacity than a standard arterial, without the high cost and often disruptive impacts of a freeway. Many of the proposed freeways and parkways included in this alternative reflect recent municipal planning efforts, including improvements recommended in the City of Goodyear *Sonoran Planning Area General Plan Amendment*, the *Casa Grande Small Area Transportation Study*, the *Maricopa Regional Transportation Plan Update*, and the Pinal County *RSRSM Plan*. Additionally, the Hassayampa Freeway is a new freeway introduced to the study area as an extension of a freeway proposed in the *MAG I-10 Hassayampa Valley Transportation Framework Study*. Proposed local service and system traffic interchange locations, spaced at least two miles apart wherever possible, are also shown in Figure 5-1.

This alternative was designed to provide a high level of geographically balanced capacity to handle long-term travel demand in both the east-west and north-south directions. Alternative A is considered environmentally moderate, with some high-capacity corridors near environmentally sensitive areas such as Sonoran Desert National Monument. It is also highly supportive of key economic activity centers.

The following bullet points enumerate high-capacity elements (freeways and parkways) of Alternative A. The list does not include facilities already scheduled and funded for construction as part of the current MAG Regional Transportation Plan (RTP).

Freeways (or similarly designed facilities with fully controlled access and four to five lanes per direction at Buildout):

- SR-85, improved to a full freeway from I-10 south to I-8. The RTP funds construction of a four-lane divided highway, with right-of-way preservation for a future (unfunded) upgrade to a

freeway.

- SR-303L Extension (also referred to as Loop 303 Extension), extended through Goodyear to a junction with the Hassayampa Freeway. The RTP funds construction south only as far as proposed SR-801, with funds earmarked for right-of-way preservation to approximately Patterson Road.

- SR-303L Spur (also referred to as Loop 303 Spur), a continuation of north-south SR-303L through Maricopa County from its junction with the Hassayampa Freeway to I-8. This segment traverses two large master-planned communities.

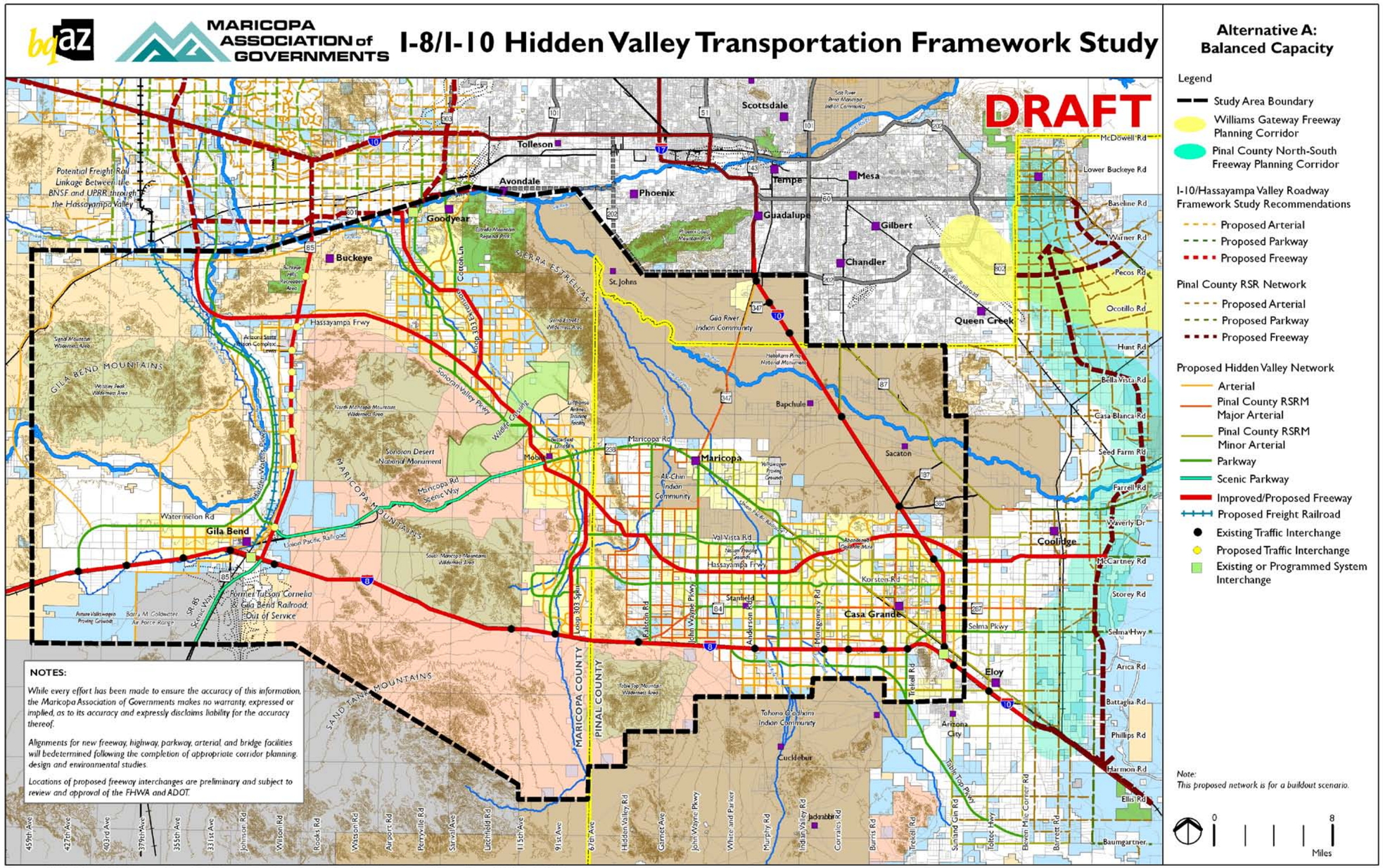
- Hassayampa Freeway, extending south and east from the Hassayampa Valley to Coolidge, terminating at the proposed North-South Freeway and (east of the Hidden Valley study area) currently under study by ADOT. Approximately 80 miles of the Hassayampa Freeway is in the study area. Regional planners envision this freeway as part of a future Interstate highway and international trade route that could begin at I-10 in Cochise County, bypass the Tucson and Phoenix metropolitan areas, and continue north of Wickenburg within the existing US-93 corridor to a junction with I-15 in the Las Vegas area. (ADOT is currently concluding a series of Regional Framework Studies statewide that will serve as a foundation to update the State Long-Range Transportation Plan. This corridor is under review in the Northern and Western framework studies.) The corridor could also serve a portion of the north-south CANAMEX international trade corridor function in Arizona.

- Montgomery Road Freeway, a north-south facility extending along the approximate alignment of Montgomery Road from I-8 to Val Vista Road, or approximately 10 miles. This is included as a high-capacity facility in the *Casa Grande Small Area Transportation Study*.

- Existing I-8 would eventually be widened between I-10 and the SR-303L Spur to at least three lanes per direction. No new service interchanges are proposed, but there would be a system interchange at SR-85.

- ADOT eventually plans to widen existing I-10 between Phoenix and Tucson to approximately five lanes per direction. (ADOT is currently developing two Environmental Assessments/Design Concept Reports between SR-202L in Phoenix and Tangerine Road in Tucson that will recommend an ultimate cross-section for each segment.) No new service interchanges are included in Alternative A, but a reconstructed system interchange is proposed at the I-10/I-8 junction.

Figure 5-1: Alternative A



Arizona Parkways (intermediate-capacity, six- to eight-lane divided highways with partial access control and no direct left turns permitted at major intersections), generally spaced every three to five miles:

North-South Parkways

- Woolsey Peak Parkway (an extension southward from the Hassayampa Valley, parallel to the Gila River south to Gila Bend and west along Watermelon Road to I-8)
- SR-85 Scenic Way (SR-85 south of I-8; scenic way designation denotes a typical parkway cross-section with a more rural emphasis on wildlife crossings and visual preservation)
- Sonoran Parkway (SR-801 through south Goodyear to I-8)
- Cotton Lane (SR-801 to SR-303L Extension)
- Ralston Road (SR-238 to I-8)
- Trekell Road (I-8 to Table Top Parkway)

East-West Parkways

- Maricopa Road Scenic Way (SR-85 to Hassayampa Freeway)
- SR-238 (continuation of Maricopa Road east of Hassayampa Freeway through Maricopa, and south to I-8 along approximately Russell Road)
- Val Vista Road (SR-303L Spur to Hassayampa Freeway at SR-387)
- McCartney Road (I-10 to Hassayampa Freeway)
- Cimarron Loop (through Cimarron master-planned community in Maricopa County)
- Kortsen Road (extension of Cimarron Loop from SR-303L Spur to I-10)
- SR-84 (SR-347 to Montgomery Road Freeway)
- Selma Parkway (Trekell Road interchange to proposed North-South Freeway)

A fully directional system interchange would be provided at each junction between freeways. Smaller-scale system interchanges are envisioned for freeway-parkway junctions, and grade-separated intersections may be provided at junctions between two parkways.
Alternative A also has a background network of arterial streets that would accommodate shorter trips in and between Hidden Valley communities. The one-mile grid shown in Pinal County reflects the *RSRSM Plan*. As in the Hassayampa Valley, the arterial network would most likely be funded by developers of adjacent land in cooperation with local governments.

It is important to recognize that roadway locations in Alternative A are intended to show generalized corridors, not specific alignments. All of the routes are subject to modification and refinement as detailed corridor studies are conducted and local circulation plans are further developed.

Roadway connections on the northern border of the study area are designed to match up as well as possible with recommendations from the Hassayampa Valley Framework. Recommended connections between the two framework areas include:

- Maintain an arterial roadway parallel to the northern Hidden Valley study area boundary, south of the Gila River. This arterial begins at Tonopah Parkway, approximately on the Williams Field Road alignment, and terminates at the junction of Estrella Parkway and Cotton Lane.
- Reduce Tonopah Parkway from a parkway to an arterial south of the SR-801 extension; terminate it at the Williams Field Road arterial.
- Maintain Vulture Mine Road/363rd Avenue as an arterial; terminate it at Williams Field Road arterial.
- Extend Hidden Waters Parkway (previously terminated at SR-801 in the Hassayampa Valley) through the Hidden Valley.
- Extend Sun Valley Parkway as a parkway to the Williams Field Road arterial. This parkway previously changed to an arterial south of SR-801 in the Hassayampa Valley.
- Maintain Miller Road as an arterial; terminate it at Williams Field Road arterial.
- Maintain Watson Road Parkway, relocated closer to the SR-303L Extension, into the Hidden Valley;.

- Maintain arterial and parkway alignments and connections through Goodyear (i.e. Rainbow Road, Dean Road, Verrado Way/Airport Road, Jackrabbit Trail, Estrella/Sonoran Parkway, Cotton Lane).

Table 5.2 summarizes key characteristics of the base network presented as Alternative A. Figures 5-2 and 5-3 illustrate typical parkway design features, including sample cross-sections and the indirect or "Michigan" left turn concept that several MAG member agencies are considering.

Table 5.2 Summary of Base Network Alternative A

Network Characteristic	Description
Anticipated Completion	Buildout
Types of Roadways Included	Freeways, Parkways/Scenic Ways, Arterials
Parkway and Scenic Way Design Features	Minimum 200-foot right-of-way
	60-foot landscaped median (typical)
	Typically six- or eight-lane divided
	No direct left turns at major intersections
	Inclusion of wildlife crossings, where appropriate, especially on scenic ways
High-Capacity Roads	Includes many facilities from local community plans; introduces some new freeways
Network Operation	Network is a combination of the MAG and Pinal County models; analyzes network deficiencies based on Buildout conditions
East-West Capacity	Balanced, with reasonably frequent and consistent freeway and parkway spacing
North-South Capacity	Balanced, with reasonably frequent and consistent freeway and parkway spacing
Support of Economic Activity Centers	Highly supportive of key economic activity centers
Environmental Consideration	Environmentally moderate; some high-capacity corridors near environmentally sensitive features
Special Facilities	Wildlife crossings; scenic way designations

Source: MAG study team, June 2009

5.2.2 Additional Roadway Network Alternatives

The study team incorporated suggestions from the Funding Partners, SRT members, and other stakeholders in the conceptual formulation and mapping of six additional roadway network alternatives, which were modeled alongside Alternative A. In these alternatives, roadways were reclassified, where necessary, to respond to capacity deficiencies revealed by the initial unconstrained model run. Reclassification to a higher level (for example, from a parkway to a freeway or from an arterial to a parkway) provided additional capacity to eliminate deficiencies. A brief discussion of principal features of these six network alternatives follows. Additionally, Table 5.3 summarizes differences between each alternative and the base (Alternative A).

Alternative A1 is a simple variation of Alternative A. As Figure 5-4 illustrates, Alternative A1 upgrades an arterial east of the SR-303L Extension through southern Goodyear to a parkway labeled Hombre de Agua, connecting Cotton Lane to the Hassayampa Freeway and the Sonoran Valley Parkway. Conversely, this alternative omits the north-south parkway parallel to the SR-303L extension along Waterman Wash from the Gila River to approximately Pecos Road. From Pecos Road to the Sonoran Valley Parkway, this (north-south) parkway is reduced to an arterial.

Figure 5-2: Generalized Arizona Parkway Cross-Section

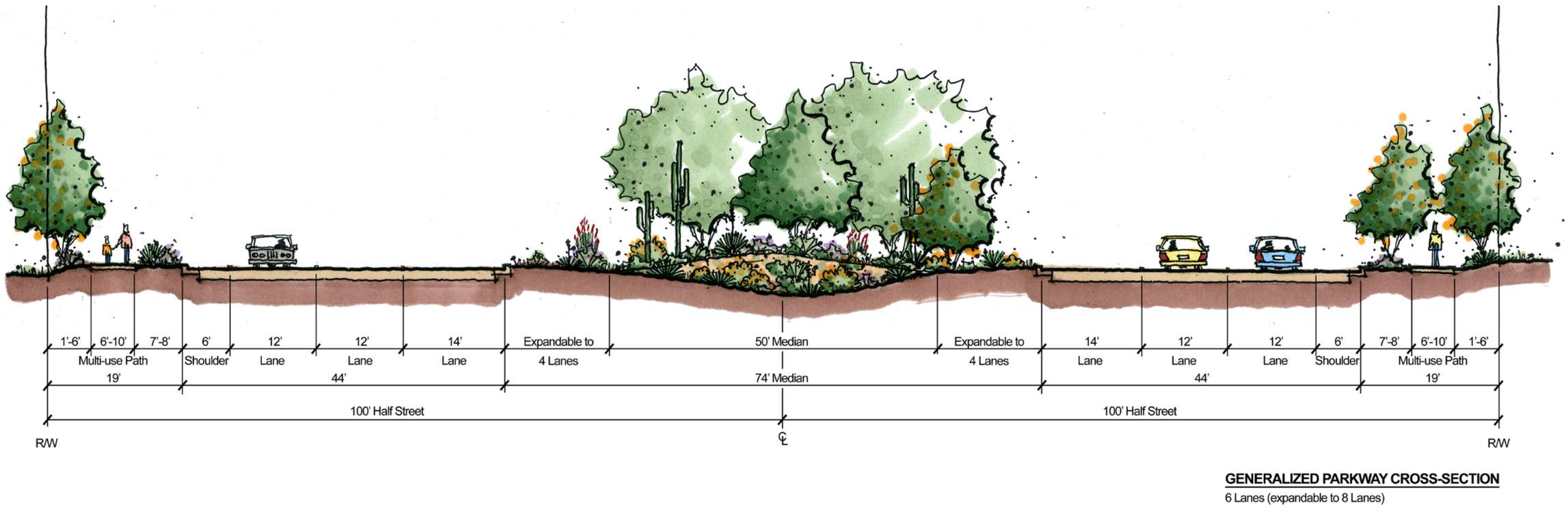
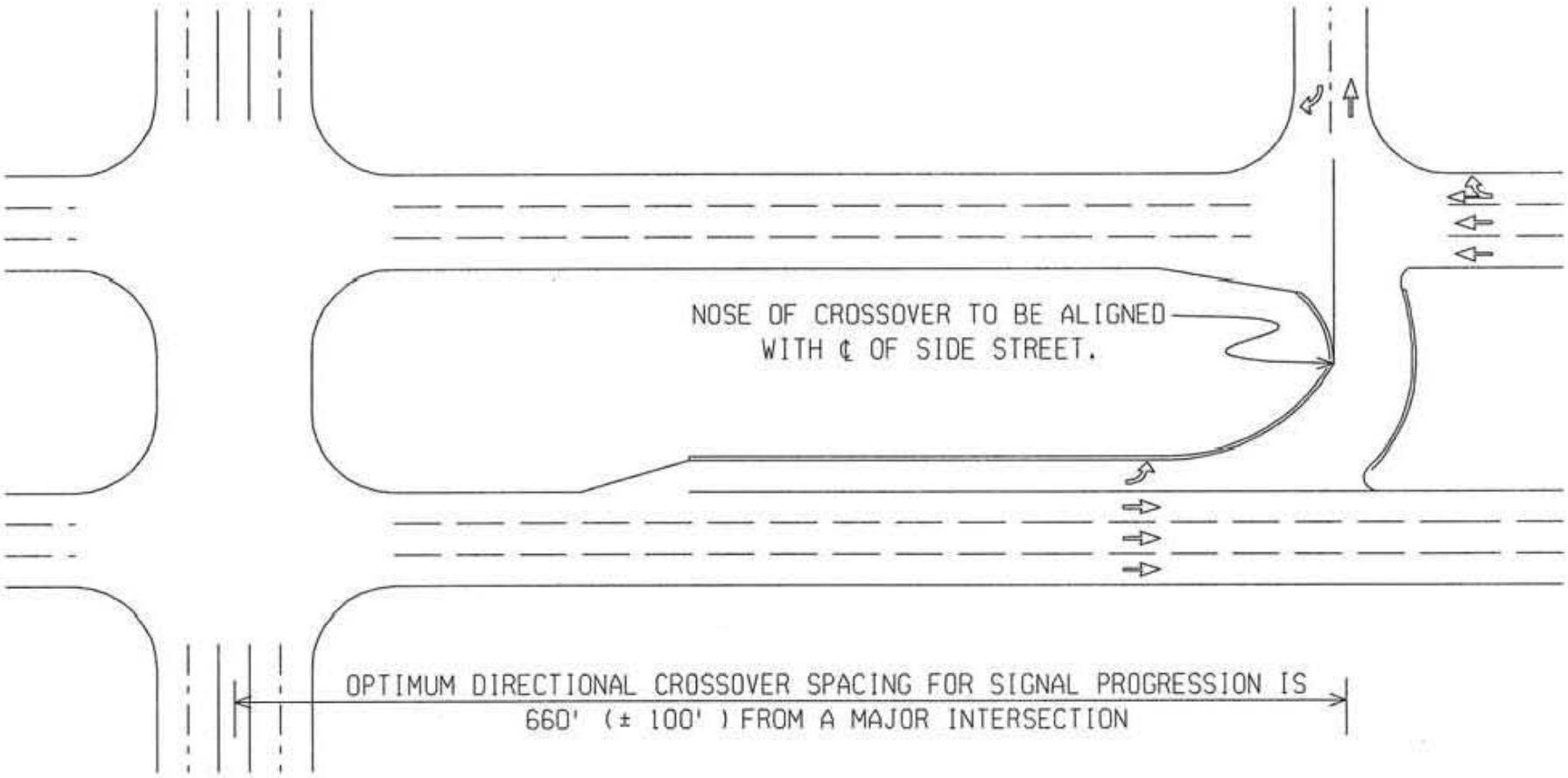


Figure 5-3: Parkway to Arterial Intersection



The remaining five roadway network alternatives contain more significant departures from the base roadway network. Alternative B (Figure 5-5) maximizes mobility by upgrading several corridors to a higher functional classification. Compared with Alternative A, this alternative increases east-west and north-south capacity, is slightly less environmentally sensitive, and is even more supportive of key economic activity centers. Differences from Alternative A include the upgrade of the westernmost arterial looping around the Gila Bend Mountains to a parkway, from the SR-801 extension in the Hassayampa Valley to Woolsey Peak Parkway. Two facilities are upgraded from parkways to freeways: the SR-238 parkway from the Hassayampa Freeway through Maricopa and south (using the Anderson Road corridor) to I-8, and Ralston Road from SR-238 to the Hassayampa Freeway.

Alternative C, in contrast to B, is designed to minimize impacts by downgrading or omitting several facilities. This makes it the most environmentally sensitive of the alternatives discussed so far (Figure 5-6). Alternative C decreases east-west and north-south capacity, and therefore offers decreased access to key economic activity centers. Differences in this alternative (from A) include removing the western arterial looping around the Gila Bend Mountains. Several parkways (and scenic ways) are downgraded to arterials, including Woolsey Peak Parkway from the Hassayampa Freeway to I-8, SR-85 south of I-8, Sonoran Parkway from Waterman Wash to I-8, Maricopa Road from Woolsey Peak Parkway to the Hassayampa Freeway, SR-238 from the Hassayampa Freeway to I-8, Ralston Road from SR-238 to I-8, SR-347 from SR-238 to Val Vista Road, Kortsen Road from SR-303L Spur to SR-347, and Val Vista Road from SR-303L Spur to the Hassayampa Freeway. Freeways downgraded to parkways include the SR-303L Spur; Montgomery Road Freeway, and Hassayampa Freeway from the SR-303L Spur to the North-South Freeway.

Alternatives C1, C2, and C3 include minor variations from Alternative C while maintaining its minimum impact philosophy. Alternative C1, as shown in Figure 5-7, resembles Alternative C in that it omits the western arterial looping around the Gila Bend Mountains and downgrades six parkways and three freeways. It differs from Alternative C in including the Hombre de Agua Parkway, an upgraded arterial (like Alternative A1), maintaining SR-238 as a parkway between the Hassayampa Freeway junctions in Mobile and Maricopa, and maintaining Ralston Road as a parkway from SR-238 to I-8.

Table 5.3 Differences Between Base Alternative A and Other Alternatives

Network Characteristics	Alternatives					
	A1	B	C	C1	C2	C3
Degree of Difference	Minor	Substantial	Substantial	Substantial	Substantial	Substantial
Roadway Upgrades	**Arterial to Parkway:** Hombre de Agua Parkway	**Arterial to Parkway:** Arterial west of Gila Bend Mountains **Parkway to Freeway:** SR-238, Ralston Road	None	**Arterial to Parkway:** Hombre de Agua Parkway	**Arterial to Parkway:** Hombre de Agua Parkway	**Arterial to Parkway:** Hombre de Agua Parkway
Roadway Downgrades	**Omission:** Parkway parallel to Waterman Wash from the Gila River to Pecos Road **Parkway to Arterial:** Parkway parallel to Waterman Wash from Pecos Road to Sonoran Valley Parkway	None	**Omission:** Arterial west of Gila Bend Mountains **Parkway to Arterial:** Woolsey Peak Parkway, SR-85 south of I-8, Ralston Road, Kortsen Road from SR-303L Spur to SR-347, Val Vista Road **Freeway to Parkway:** SR-303L Spur, Montgomery Road Freeway, Hassayampa Freeway from SR-303L Spur to North-South Freeway	**Omission:** Arterial west of Gila Bend Mountains **Parkway to Arterial:** Woolsey Peak Parkway, SR-85 south of I-8, Sonoran Valley Parkway, Maricopa Road Scenic Way, SR-347, Kortsen Road from SR-303L Spur to SR-347, Val Vista Road **Freeway to Parkway:** SR-303L Spur, Montgomery Road Freeway, Hassayampa Freeway from SR-303L Spur to North-South Freeway	**Omission:** Arterial west of Gila Bend Mountains **Parkway to Arterial:** Woolsey Peak Parkway, SR-85 south of I-8, Sonoran Valley Parkway, Maricopa Road Scenic Way, SR-347, Kortsen Road from SR-303L Spur to SR-347, Val Vista Road **Freeway to Parkway:** SR-303L Spur, Montgomery Road Freeway, Hassayampa Freeway from I-10 to North-South Freeway	**Omission:** Arterial west of Gila Bend Mountains **Parkway to Arterial:** Woolsey Peak Parkway, SR-85 south of I-8, Sonoran Valley Parkway, Maricopa Road Scenic Way, SR-347, Kortsen Road from SR-303L Spur to SR-347, Val Vista Road **Freeway to Parkway:** Montgomery Road Freeway, Hassayampa Freeway from SR-303L Spur to North-South Freeway

Table 5.3 – Continued

Network Characteristics	Alternatives					
	A1	B	C	C1	C2	C3
Environmental	Similar to Alt A	Greater potential to impact Gila Bend Mountains	Most sensitive to environment	Environmentally sensitive, similar to Alt C	Environmentally sensitive, similar to Alt C	Environmentally sensitive, similar to Alt C
East-West Capacity	Similar to Alt A	Increased	Significantly decreased	Significantly decreased	Decreased	Decreased
North-South Capacity	Decreased in south Goodyear	Increased	Significantly decreased	Significantly decreased	Significantly decreased	Decreased
Support of Economic Activity Centers	Decreased in south Goodyear	Greater than Alt A due to higher capacity	Decreased freeway and parkway accessibility	Decreased freeway and parkway accessibility	Decreased parkway accessibility	Decreased freeway and parkway accessibility

Source: MAG study team, June 2009

Figure 5-4: Alternative A1

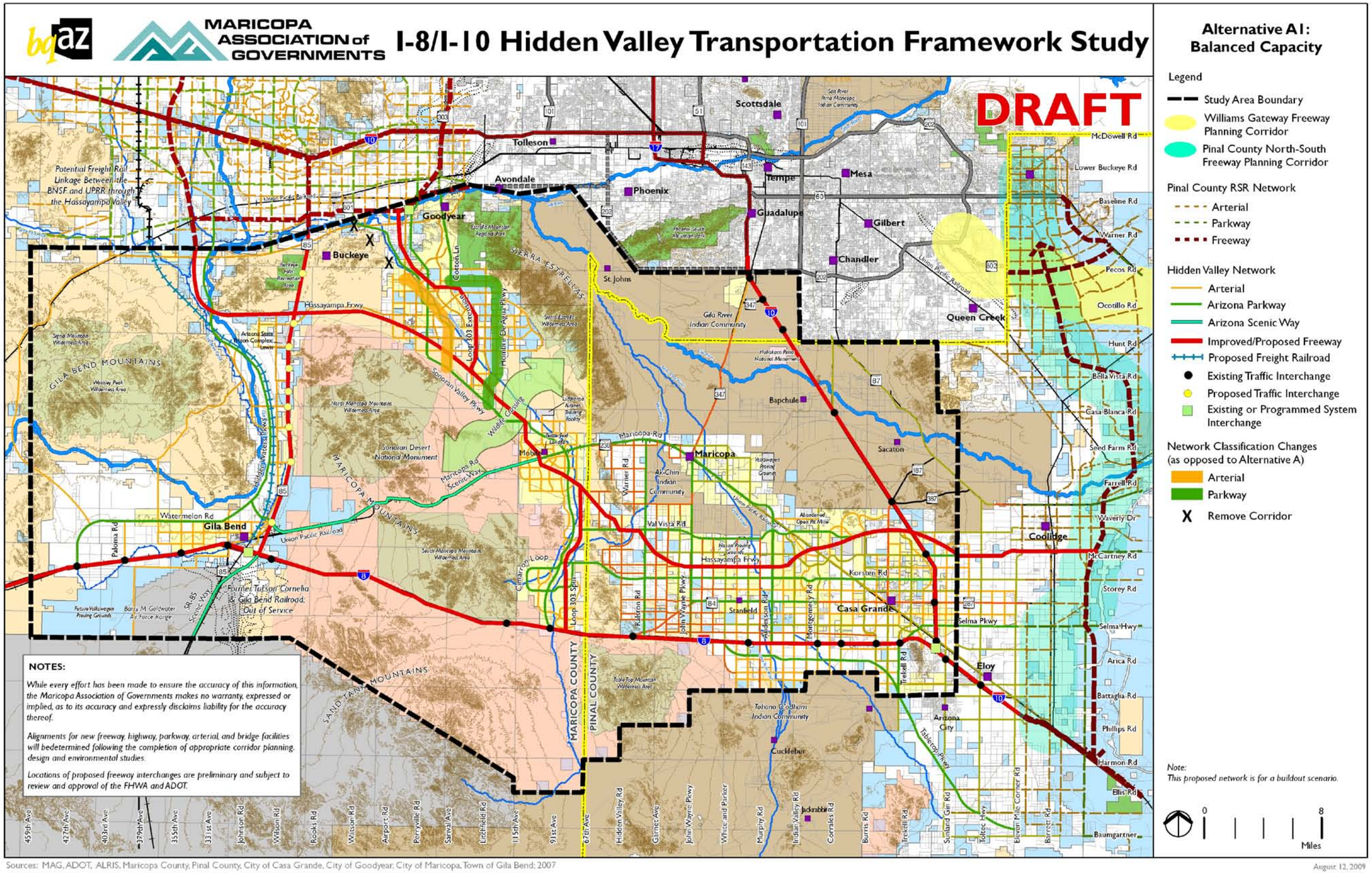


Figure 5-5:
Alternative B

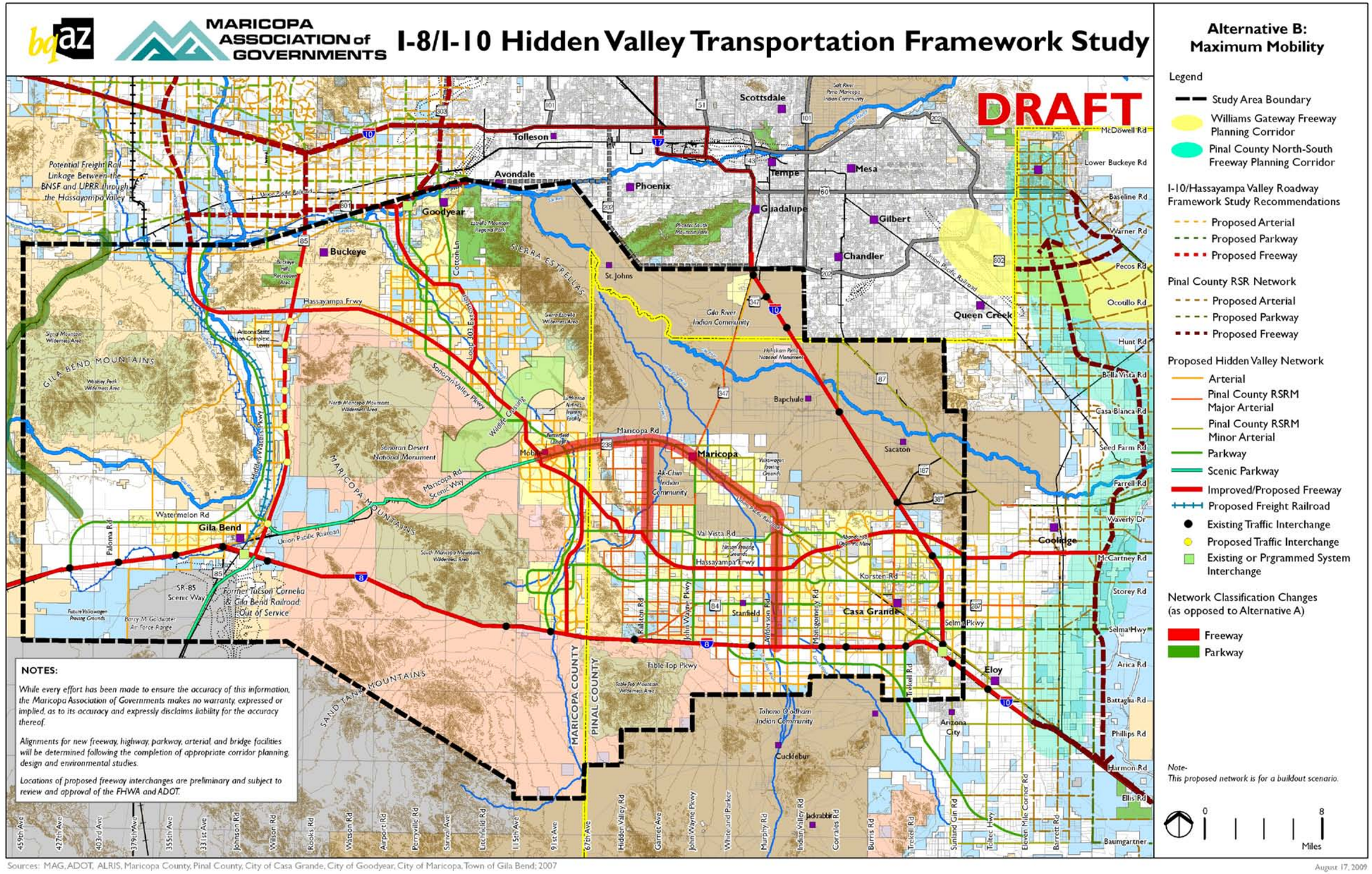


Figure 5-6: Alternative C

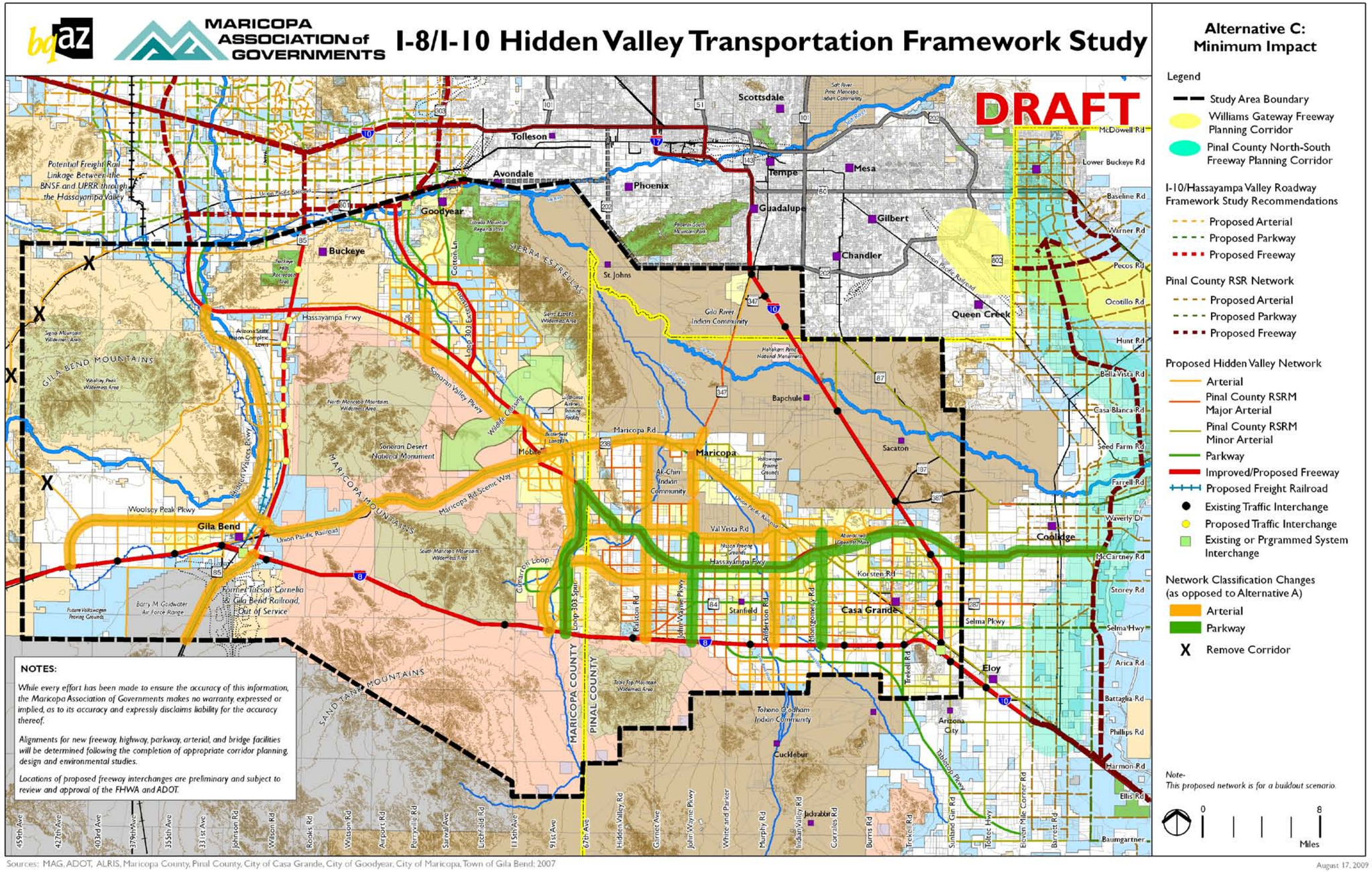
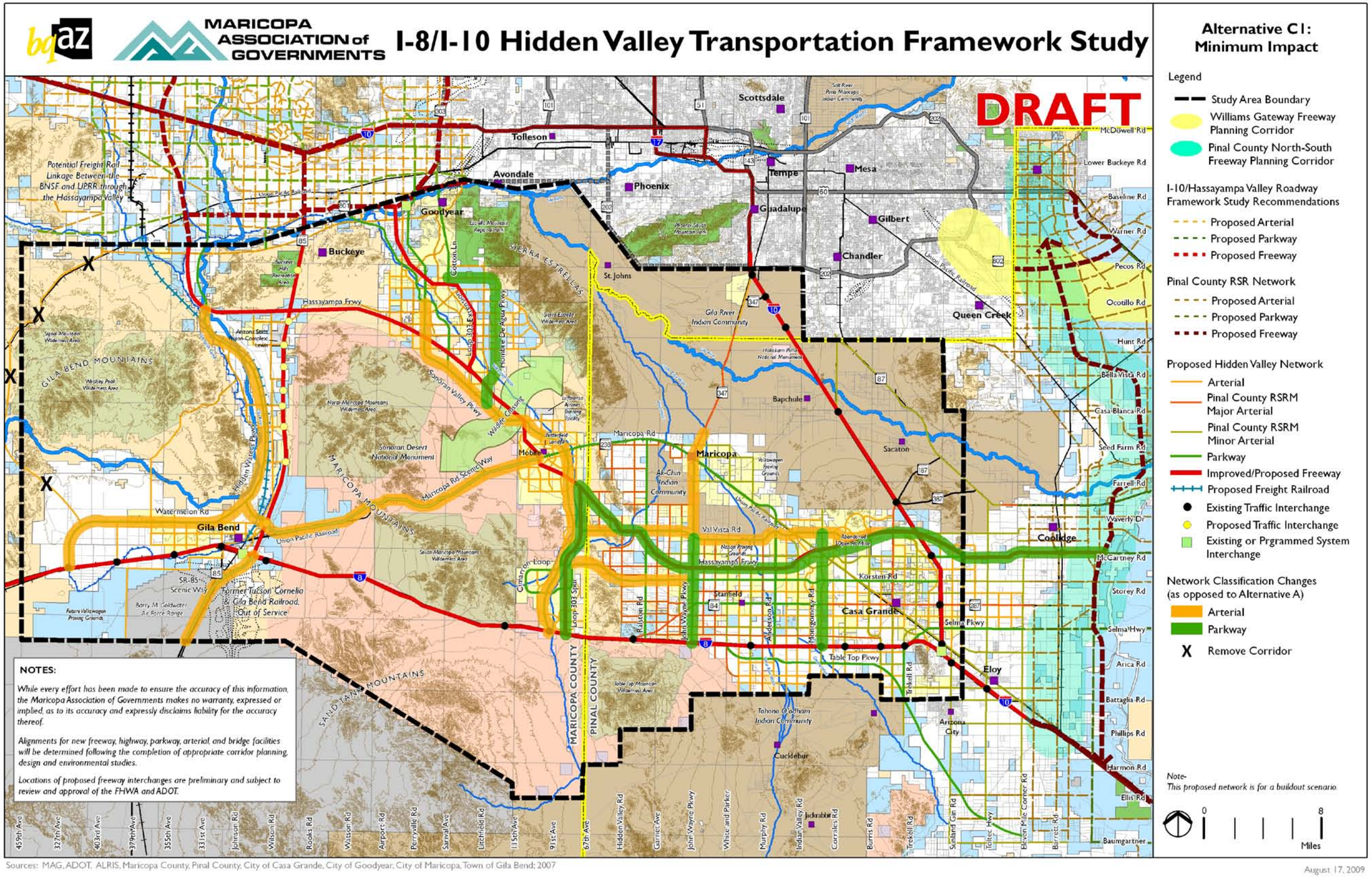


Figure 5-7: Alternative C1



Alternative C2, like C1, includes Hombre de Agua Parkway, SR-238 as a parkway between the Hassayampa Freeway junctions in Mobile and Maricopa, and Ralston Road as a parkway from SR-238 to I-8. Unlike Alternative C1, however, C2 preserves the Hassayampa Freeway as a freeway east to I-10 (Figure 5-8).

Alternative C3 is even more similar to C1. It differs, however, in maintaining the freeway classification of the SR-303L Spur, rather than reducing it to a parkway (Figure 5-9).

5.2.3 Initial Transit Alternatives

Because the Hidden Valley Transportation Framework Study is a multimodal visioning effort, the study team also developed two long-range transit development alternatives. Transit Alternative A, the Base Transit Scenario, was intended to supplement the base roadway network (Alternative A). As shown on the accompanying map (Figure 5-10), this alternative includes:

- Local transit service (fixed-route bus and Americans with Disabilities Act (ADA) paratransit) in the future urbanized areas of the Hidden Valley, including Maricopa, Casa Grande, Mobile, south Goodyear and Gila Bend.
- An enhanced, generally north-south transit corridor in Goodyear, as envisioned in that city's long-range plans. The service may ultimately operate at least partly on a dedicated guideway. It could begin using rubber-tired vehicles, but then evolve to an urban rail technology depending on future funding and demand.
- Potential regional commuter service (perhaps in the form of express buses or freeway bus rapid transit (BRT) along regional high-capacity roads such as I-10, SR-347, SR-85 and the SR-303L Extension south of the Gila River. High occupancy vehicle (HOV) lanes are envisioned on these highways to minimize delays to transit riders due to traffic congestion. Commuter rail will be studied as an option for SR-347 from Tempe to Maricopa. Transit in this corridor could evolve in a manner similar to the Goodyear north-south corridor.
- Several park-and-ride lots, with approximate conceptual locations shown on the map.

Because the Funding Partners, SRT and other stakeholders strongly supported a more ambitious long-range transit program for the Hidden Valley, the study team developed Transit Alternative B, Enhanced Transit Scenario (Figure 5-11). This scenario adds substantial services and facilities to Alternative A, including:

- Extension of the Goodyear north-south transit spine south to the western edge of the future Casa Grande urbanized area.
- Direct regional transit connections to potential rail passenger service (commuter and intercity) operating between the Phoenix and Tucson metropolitan areas. MAG and ADOT are cooperatively studying regional passenger rail to connect Maricopa, Pinal and Pima counties.
- Extension of the regional commute transit corridor along the SR-303L Extension south from Goodyear through Mobile to western Casa Grande.
- Additional express bus or BRT corridors offering limited-stop service on selected Arizona parkways, especially in the Casa Grande and Maricopa areas.
- Several additional park-and-ride lots at strategic locations.

One of the two transit alternatives was explicitly intended to provide superior service, and as explained in Chapter 4, transit was not modeled in this study. Therefore, there was no formal evaluation of transit alternatives A and B.

Figure 5-8: Alternative C2

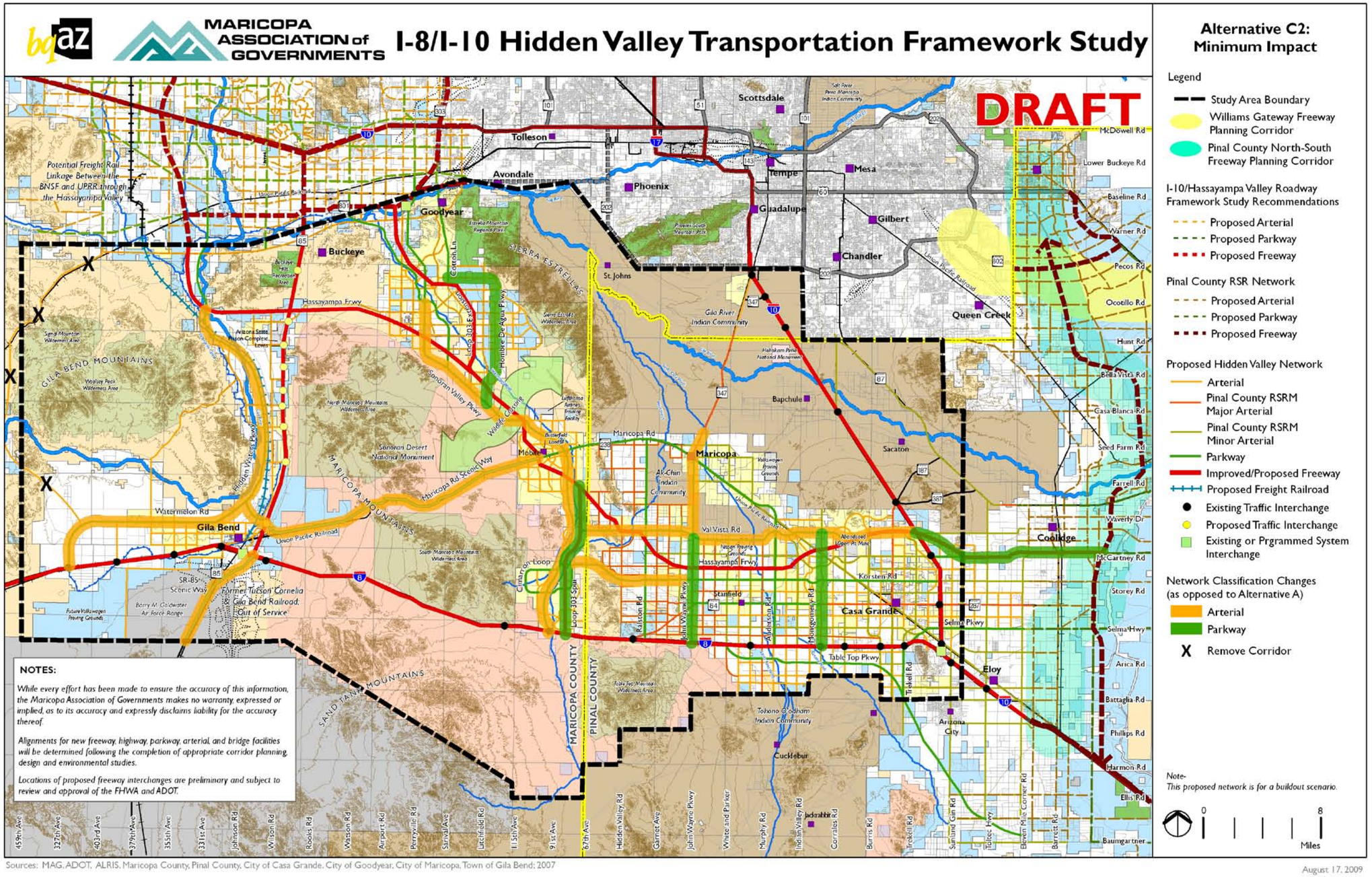


Figure 5-9: Alternative C3

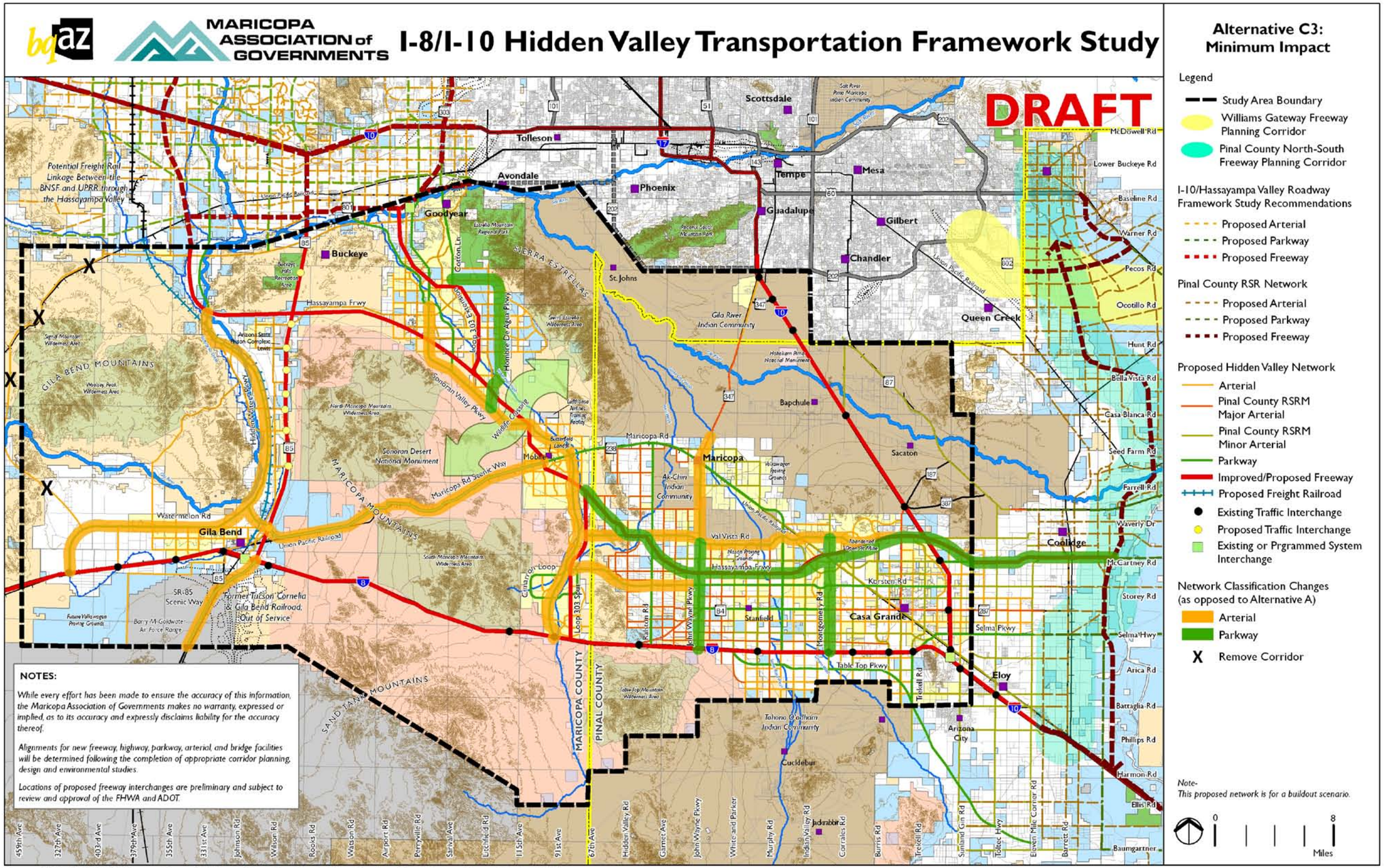


Figure 5-10: Transit Alternative A – Base Transit Scenario

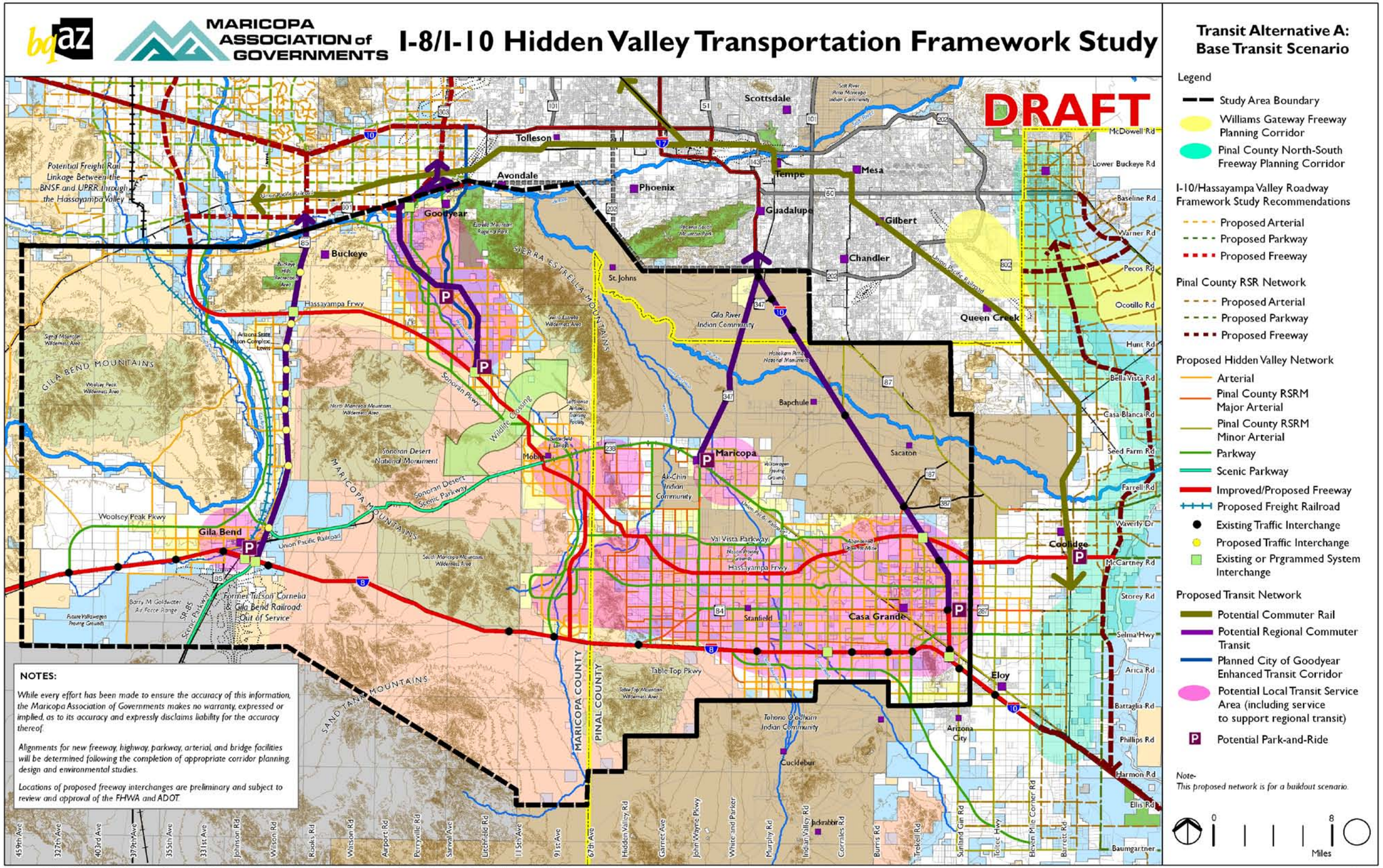
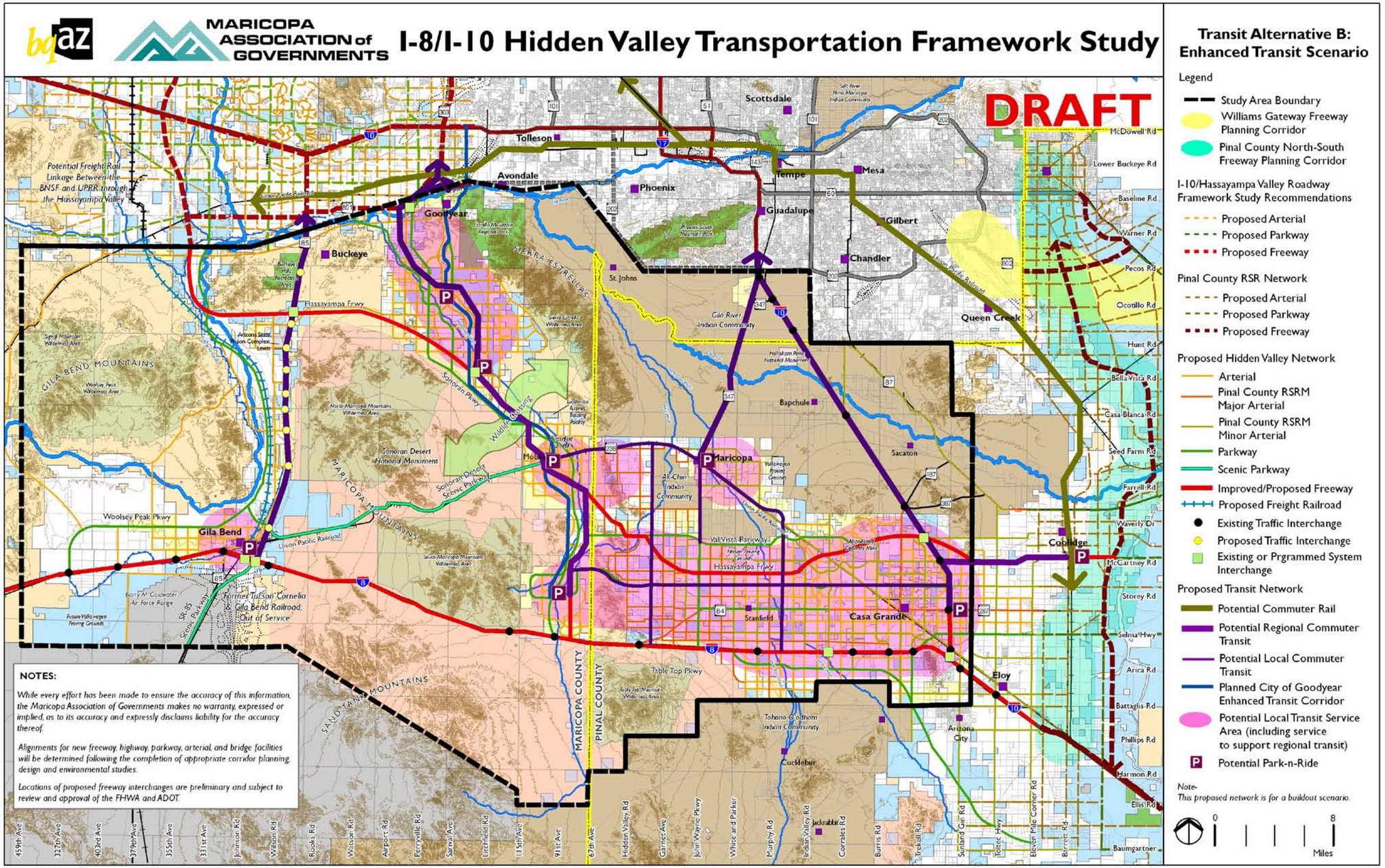


Figure 5-11: Transit Alternative B – Enhanced Transit Scenario



5.3 Tiered Evaluation of Alternatives

The Hidden Valley roadway network alternatives were evaluated in a two-tiered process by applying the criteria and performance objectives described in Section 5.1. In Tier 1, the seven original alternatives were screened down to four, using only the safety and mobility criteria. The more detailed Tier 2 evaluation used all the criteria and objectives to evaluate the remaining alternatives in more depth, and to select a recommended alternative.

The (quantitative) safety and mobility portion of the evaluation was conducted by applying constrained travel times, based on roadway link capacities identified within the network and the effects of congestion. Travel time constraints took into account the differing functional characteristics of the alternative networks. Imposing travel time constraints recognized specific limitations of network links and enabled the study team to identify deficiencies and define potential opportunities for improvements. Chapter 4 describes the use of constrained and unconstrained roadway networks in detail.

5.3.1 Tier 1 Screening

Table 5.4 shows how Alternatives A, A1, B, C, C1, C2, and C3 were first evaluated using the ten safety and mobility objectives. As a benchmark for comparison, the Existing plus Committed roadway network (from Chapter 4) is included as well, using results based on the existing and programmed transportation network in the Hidden Valley. The scoring scheme was not applied to this network.

The left column of the table lists the performance objectives associated with the pertinent evaluation criteria. Each objective involves measurement of a specific characteristic. The remaining columns report the numerical performance of the alternatives and compare their scores with each other. For some measures of effectiveness (i.e., travel speed), a higher number means superior performance. In other cases, such as vehicle miles of travel (an indicator of congestion), a lower number is better.

The MAG study team then translated each numerical score into either a full circle (●), a half circle (◒), or an empty circle (○). The alternatives with the best performance were assigned a full circle, while those that fared worst were given an empty circle. In each case, intermediate alternatives received a half circle. The distribution of circles among alternatives followed logical breaks between groupings whenever possible. With three of the objectives, for example, only one alternative (which clearly stood out from the rest) was assigned to the highest-performing group (●).

The next step in this portion of the evaluation consisted of computing streamlined point scores for each alternative. A value of two points was assigned to each full circle (●) and one point to each half circle (◒). Alternatives in the poorest-performing group (○) received no points. Finally, the team calculated the total score for each alternative by adding the partial scores across rows.

The last row of Table 5.4 divstinguishes a higher-performing group of alternatives from a lower-performing group. Three of the alternatives (A, A1, B) have scores of 11 to 16, while the remaining four have scores of 3 to 7. Common elements of the three highest-scoring alternatives include the minimization of freeway and other lane miles operating at LOS E or F and the minimization of percent daily congested vehicle miles traveled – these three alternatives have the most high-capacity lane miles.

As a result, Alternatives A, A1, and B were carried forward into the Tier 2 evaluation. Knowing that the location of the selective parkways and freeways could be controversial from an environmental standpoint, the study team deemed it necessary to include one "minimum impact" scenario in the Tier 2 evaluation. Alternative C2 was selected because (i) it performed the best of the four alternatives, and (ii) it maintained the functional classification (with full access control) of the Hassayampa Freeway to I-10, a logical terminus. Thus, four alternatives—A, A1, B and C2--survived the Tier 1 screening.

Table 5.4 Tier 1 Safety and Mobility Evaluation Matrix for Roadway Alternatives A, A1, B, C, C1, C2 and C3

Objectives	Alternatives							
	Existing + Committed	A	A1	B	C	C1	C2	C3
Minimize daily vehicle miles of travel (VMT) per lane mile	*18,600*	10,600 ●	11,000 ◒	10,400 ●	11,100 ◒	11,200 ◒	11,200 ◒	11,400 ◒
Maximize the percent of daily VMT on freeways	*33*	63 ◒	64 ◒	71 ●	56 ○	57 ○	64 ◒	60 ○
Minimize the (daily) percent of freeway lane miles operating at Level of Service E or F	*90*	34 ●	33 ●	36 ●	41 ◒	45 ○	40 ◒	47 ○
Minimize the (daily) percent of lane miles on all facilities operating at LOS E or F	*59*	19 ●	20 ●	18 ●	29 ○	30 ○	25 ◒	30 ○
Minimize the percent of congested (LOS E or F) daily VMT	*89*	40 ●	41 ●	41 ●	50 ◒	54 ○	48 ◒	54 ○
Minimize the number of roadways with (daily) LOS of E or F across all designated cut-lines	*48*	16 ◒	19 ◒	12 ●	21 ○	24 ○	22 ○	23 ○
Minimize the volume/capacity (V/C) ratio across all designated north-south cut-lines	*1.8*	0.9 ◒	0.9 ◒	0.8 ●	0.9 ◒	0.9 ◒	0.9 ◒	0.9 ◒
Minimize the V/C ratio across all designated east-west cut-lines	*1.8*	0.8 ●	0.9 ◒	0.8 ●	0.8 ●	0.9 ◒	0.9 ◒	0.9 ◒
Total Score		**13**	**11**	**16**	**6**	**3**	**7**	**3**

● = highest rating; ◒ = intermediate; ○ = lowest

Numerical scoring scheme: 2 points per ●; 1 point per ◒; 0 points per ○

Source: MAG study team, June 2009

5.3.2 Tier 2 Evaluation

The Tier 2 evaluation (Table 5.5) used all of the criteria and performance measures from Section 5.1 to evaluate Alternatives A, A1, B, and C2, and to compare them with each other. The safety and mobility performance measures are identical to those used in Table 5.4. However, as explained in Chapter 4, the numerical values of these measures are typically not the same in Tier 2 as they were in Tier 1. These differences occur because MAG refined the model in Tier 2 to include a finer structure of Transportation Analysis Zones (TAZ) and additional roadway links to reflect travel between Maricopa and Pinal counties. These enhancements made the Tier 2 model more sensitive to population and employment dynamics under Buildout conditions in the study area, especially in western Pinal County. Therefore, the "Consumer Reports" icon (full, half, or empty circle), for a given objective and alternative may also differ from the one shown in Table 5.4.

The criteria and performance measures in the seven remaining categories (access, planning consistency, environmental compatibility, economic benefit, cost, ease of implementation, and cost/benefit) were used only in Tier 2. Because many of the measures are subjective, an explanation of each full, half, or empty circle is provided where appropriate. As in Tier 1, the total score of each alternative was obtained by adding the partial scores across rows.

Table 5.6 shows how planning-level capital costs, in constant 2009 dollars, were calculated for use in the cost and cost/benefit evaluations. Most of the unit costs are based on cost data for projects in the current edition of the MAG RTP and TIP. RTP examples were used primarily for large projects such as freeways and system traffic interchanges (TIs), while the TIP was consulted for information on new and reconstructed arterials. All of these unit costs are likely to change substantially during subsequent planning and design concept work. They will also vary by location according to terrain, drainage, soil conditions, and other characteristics.

Table 5.7 provides a capital cost breakdown for each of the four Tier 2 alternatives. Alternative B has the most freeway lanes miles and traffic interchanges, while alternatives A, A1, and C2 have significantly more parkway lane miles.

5.3.3 Results and Recommendation

The last line of Table 5.5 gives the total score of each Tier 2 alternative based on all the evaluation criteria and performance measures. Alternative B scores the lowest, owing mainly to its high cost, substantial environmental impact, and lack of support from the community and stakeholders. The highest scoring options are A, the base network that represents a "middle of the road" alternative, and its close variant, A1. Alternative C2, the most environmentally sensitive, fares only slightly worse than A and A1, but much better than B. As the next chapter shows, the recommended alternative is based primarily on Alternative A with some of the environmentally sensitive characteristics of Alternative C.

Table 5.5 Detailed Tier 2 Evaluation Matrix for Roadway Alternatives A, A1, B and C2

Goals/Objectives	Alternatives				
	Existing + Committed	A	A1	B	C2
Safety & Mobility					
Minimize daily vehicle miles of travel (VMT) per lane mile	20,400	13,900 ●	13,800 ●	13,900 ●	13,800 ●
Maximize the percent of daily VMT on freeways	43	53 ◒	53 ◒	57 ●	51 ◒
Minimize the (daily) percent of freeway lane miles operating at Level of Service E or F	91	76 ●	76 ●	76 ●	75 ●
Minimize the (daily) percent of lane miles on all facilities operating at LOS E or F	68	38 ●	37 ●	36 ●	37 ●
Minimize the percent of congested (LOS E or F) daily VMT	89	64 ●	63 ●	63 ●	63 ●
Minimize the number of roadways with (daily) LOS of E or F across all designated cut-lines	74	54 ◒	54 ◒	50 ●	53 ◒
Minimize the volume/capacity (V/C) ratio across all designated north-south cut-lines	1.5	1.0 ◒	0.7 ●	1.0 ◒	1.0 ◒
Minimize the V/C ratio across all designated east-west cut-lines	1.4	1.0 ●	1.0 ●	1.1 ◒	1.1 ◒
Safety & Mobility Subtotal		**13**	**14**	**14**	**12**
Goals/Objectives	**A**		**A1**	**B**	**C2**
Access					
Maximize the percent of study area residents (Year 2030) within two miles of a (local service) freeway interchange	15% ◒		15% ◒	43% ●	15% ◒
Maximize the percent of study area employment (Year 2030) within two miles of a (local service) freeway interchange	15% ◒		15% ◒	54% ●	15% ◒
Access Subtotal	**2**		**2**	**4**	**2**
Planning Consistency					
Maximize circulation planning consistency	● Base alternative planned for consistency		◒ Moderate changes in Maricopa County	○ Substantial facility upgrades	○ Substantial facility downgrades
Maximize consistency with jurisdictional land use and economic development plans	● Most consistent with general plan elements and existing/planned economic development plans		● Most consistent with general plan elements and existing/ planned economic development plans	◒ Moderately consistent with general plan elements and existing/ planned economic development plans	◒ Moderately consistent with general plan elements and existing/planned economic development plans
Planning Consistency Subtotal	**4**		**3**	**1**	**1**

Table 5.5 – Continued

Goals/Objectives	Alternatives			
	A	A1	B	C2
Environmental Compatibility				
Minimize impacts to existing canals and flood control structures	◒ Freeway across Enterprise Canal and Old US-80 Bridge	◒ Similar to A	◒ Similar to A	◒ Similar to A
Minimize impacts associated with crossing of floodplains or disturbance of drainage features, including Waters of the U.S. under jurisdiction of U.S. Army Corps of Engineers	○ 2 new freeway crossings and 3 parkway crossings of major rivers	◒ 2 new freeway crossings and 2 parkway crossings of major rivers	○ 2 new freeway crossings and 3 parkway crossings of major rivers	● 2 new freeway crossings and 1 parkway crossing of major rivers
Minimize impacts to resources protected under Section 4(f) or 6(f)[1]	◒ Moderate impact to parks, schools, and nationally-recognized historic sites	◒ Moderate impact to parks, schools, and nationally-recognized historic sites	○ Similar to A; higher impact to schools	◒ Moderate impact to parks, schools, and nationally-recognized historic sites
Minimize impacts to areas containing known or likely habitat for Threatened, Endangered and other sensitive species	◒ Arterial moderately intrusive to species near Gila Bend Mountains	● Arterial omission least intrusive to species near Gila Bend Mountains	○ Parkway most intrusive to species near Gila Bend Mountains	● Arterial omission least intrusive to species near Gila Bend Mountains
Minimize impacts to wildlife corridors[2]	○ 8 parkway crossing equivalents	○ 8 parkway crossing equivalents	○ 8 parkway crossing equivalents	◒ 7 parkway crossing equivalents
Minimize daily VMT (in thousands)	92,300 ◒	92,100 ◒	92,600 ◒	92,100 ◒
Environmental Compatibility Subtotal	**4**	**6**	**2**	**8**
Goals/Objectives	**Alternatives**			
	A	**A1**	**B**	**C2**
Economic Benefit				
Maximize the expected gain from economic development likely to occur in response to implementation	● High degree of high-capacity connections of existing/planned economic activity centers	● High degree of high-capacity connections of existing/ planned economic activity centers	● High degree of high-capacity connections of existing/ planned economic activity centers	○ Low degree of high-capacity connections of existing/planned economic activity centers
Economic Benefit Subtotal	**2**	**2**	**2**	**0**
Goals/Objectives	**Alternatives**			
	A	**A1**	**B**	**C2**
Cost				
Minimize capital cost[3]	◒ $18.430 billion	◒ $18.509 billion	○ $19.612 billion	● $18.000 billion
Minimize operating and maintenance cost	◒ 1,722 fwy lane miles; 4,920 pkwy and arterial ln mi; 9 system TI	◒ 1,722 fwy ln mi; 4,951 pkwy and arterial ln mi; 9 system TI	○ 1,876 fwy ln mi; 4,787 pkwy and arterial ln mi; 14 system TI	● 1,667 fwy ln mi; 5,007 pkwy and arterial ln mi; 5 system TI
Minimize right-of-way cost	◒ 978 new fwy lane miles	◒ 978 new fwy lane miles	○ 1,127 new fwy lane miles	● 930 new fwy lane miles

Table 5.5 – Continued

Goals/Objectives	Alternatives			
	A	A1	B	C2
Cost				
Cost Subtotal	**3**	**3**	**0**	**6**
Ease of Implementation				
Obtain strong support from the Funding Partners and Study Review Team	● Base alternative developed with Funding Partners and SRT	● Similar to A	◒ Addition of freeway along SR-238	○ Downgrade of several freeways and parkways
Maximize the likelihood of acceptance by outside agencies, stakeholders & the community	● Elicited wide support at meetings with stakeholders	● Similar to A	○ More negative reaction from stakeholders owing to freeway construction in developed areas	○ Negative reaction from stakeholders owing to insufficient capacity for forecast growth
Minimize any legal or institutional barriers that may make one alternative harder to implement than others[4]	● None apparent	● None apparent	● None apparent	● None apparent
Ease of Implementation Total	**6**	**6**	**3**	**2**
Cost/Benefit				
Minimize capital cost per VMT[5]	◒ 2.74 cents	◒ 2.75 cents	○ 2.90 cents	● 2.68 cents
Cost/Benefit Total	**1**	**1**	**0**	**2**
GRAND TOTAL	***35***	***37***	***26***	***33***

● = highest rating; ◒ = intermediate; ○ = lowest

Numerical scoring scheme: 2 points per ●; 1 point per ◒; 0 points per ○

[1]Section 4(f) of the U.S. Department of Transportation Act and Section 6(f) of the Land and Water Conservation Fund Act (LWCFA) provide certain protections for land acquired and developed for public recreational purposes. Section 4(f) applies to federally funded transportation projects, and projects on federal land, with a potential impact on recreational resources. Section 6(f) applies to all projects, whether federally funded or not, that may affect land acquired under the LWCFA.
[2]Based on the number of freeway and parkway intersections with wildlife linkage zones, according to ADOT Wildlife Linkages Assessment Mapping. A freeway crossing is considered the equivalent of three parkway crossings.
[3]Estimated based on number of new freeway lane miles, parkway lane miles, arterial lane miles, bridges (river crossings), new system TIs, and parkway-parkway grade separations. See Tables 5.6 and 5.7.
[4]Major implementation barriers were avoided during the development of the base alternative.
[5]Assumes capital facility lifetime is 20 years. Then capital cost per VMT (over 20 years) = capital cost/daily VMT/365/20.
Source: MAG study team, June 2009

Table 5.6 Derivation of Planning-Level Capital Cost*

Cost Element	Estimated Cost per Unit	Source of Estimate
Lane Mile – Freeway**	$7,116,000	MAG RTP: SR-303L and SR-801
Lane Mile – Parkway***	$1,525,000	150% of arterial cost
Lane Mile – Arterial	$1,017,000	10 projects in MAG RTP and RTP
System TI (freeway-freeway)	$50,825,000	2 projects in RTP: SR-303L at I-17 and I-10

*2009 dollars
**Includes local service TIs
***Includes all capital costs except for freeway-parkway TIs and parkway-parkway grade separations

Sources: MAG I-10/Hassayampa Valley Transportation Framework Study (September 2007); *Engineering News Record*, construction cost index

Table 5.7 Planning-Level Capital Cost Breakdown by Alternative

Element	Cost ($ Million)[1] and Percent Total by Alternative							
	A		A1		B		C2	
	Cost	Percent	Cost	Percent	Cost	Percent	Cost	Percent
Freeways[2]	$12,253	66	$12,253	66	$13,349	68	$11,862	66
Parkways	$2,156	12	$2,298	12	$2,054	10	$2,383	13
Arterials	$3,564	19	$3,501	19	$3,497	18	$3,501	19
System TI	$457	2	$457	2	$712	4	$254	1
Total[3]	**$18,430**	**100[4]**	**$18,509**	**100**	**$19,612**	**100**	**$18,000**	**100**

[1]2009 dollars

[2]Freeway capital cost per lane mile is based on programmed cost (from the MAG RTP) for portions of the SR-303L and SR-801 freeways. Traffic interchanges along these freeways will typically be two miles apart.

[3]Total does include estimated costs for enhanced freeway-to-parkway traffic interchanges, parkway-to-parkway grade separations, or bridge crossings.

[4]Percents may not add exactly to 100 due to rounding.

Source: MAG Study Team, June 2009

Interstate 8 and Interstate 10
Hidden Valley Transportation Framework Study

Chapter 6

Implementation of Recommended Alternative

August 2009

Prepared for

MARICOPA ASSOCIATION of GOVERNMENTS

Prepared by

AECOM

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6.1 Recommended Transportation Framework

6.1.1 Summary of Roadway Elements

Following the development of alternatives, the MAG team used a two-tiered evaluation process to assess each roadway alternative based on a series of objectives, including safety and mobility, access, planning consistency, environmental compatibility, economic benefit, cost, ease of implementation, and cost/benefit. As discussed in Chapter 5, the realm of roadway network alternatives after the Tier 1 analysis was reduced from seven to four: A, A1, B, and C1. These four were further evaluated in the Tier 2 analysis, resulting in a blended recommended alternative. The recommended alternative also includes a combination of transit elements from both transit network alternatives (A and B).

While there was no formal evaluation of the transit alternatives, the Funding Partners and other stakeholders quickly reached a consensus that a workable long-range plan for the Hidden Valley must maximize transit and rail service options. Therefore, the transit component of the Framework Recommendation builds on Transit Alternative B, the enhanced alternative, but adds several rapid or limited-stop bus corridors on freeways and parkways, including a direct connection southeast to metropolitan Tucson. Another unique element of this network is a proposed commuter rail loop around the south edge of the Gila River Indian Community (GRIC), possibly connecting to existing Union Pacific rail corridors in the West Valley and the Coolidge area. The future transit corridor along SR-347 may also take the form of commuter rail.

Upon development of the recommended alternative, the MAG study team brought this conceptual network to the Funding Partners and SRT for review and comment. The team also met individually with each funding partner (ADOT, Buckeye, Goodyear, Maricopa, Maricopa County and Pinal County), as well as with Casa Grande, to discuss the recommendation. While all recommendations on tribal lands have been informally agreed upon, ***such improvements are contingent upon formal acceptance by both Ak-Chin and GRIC tribal councils***. Figure 6-1 illustrates the recommended roadway and transit framework, while Table 6.1 lists the major modifications to the base, Alternative A. Many of these changes reflect input from the local governments and tribal communities.

Figure 6-1 Recommended Network

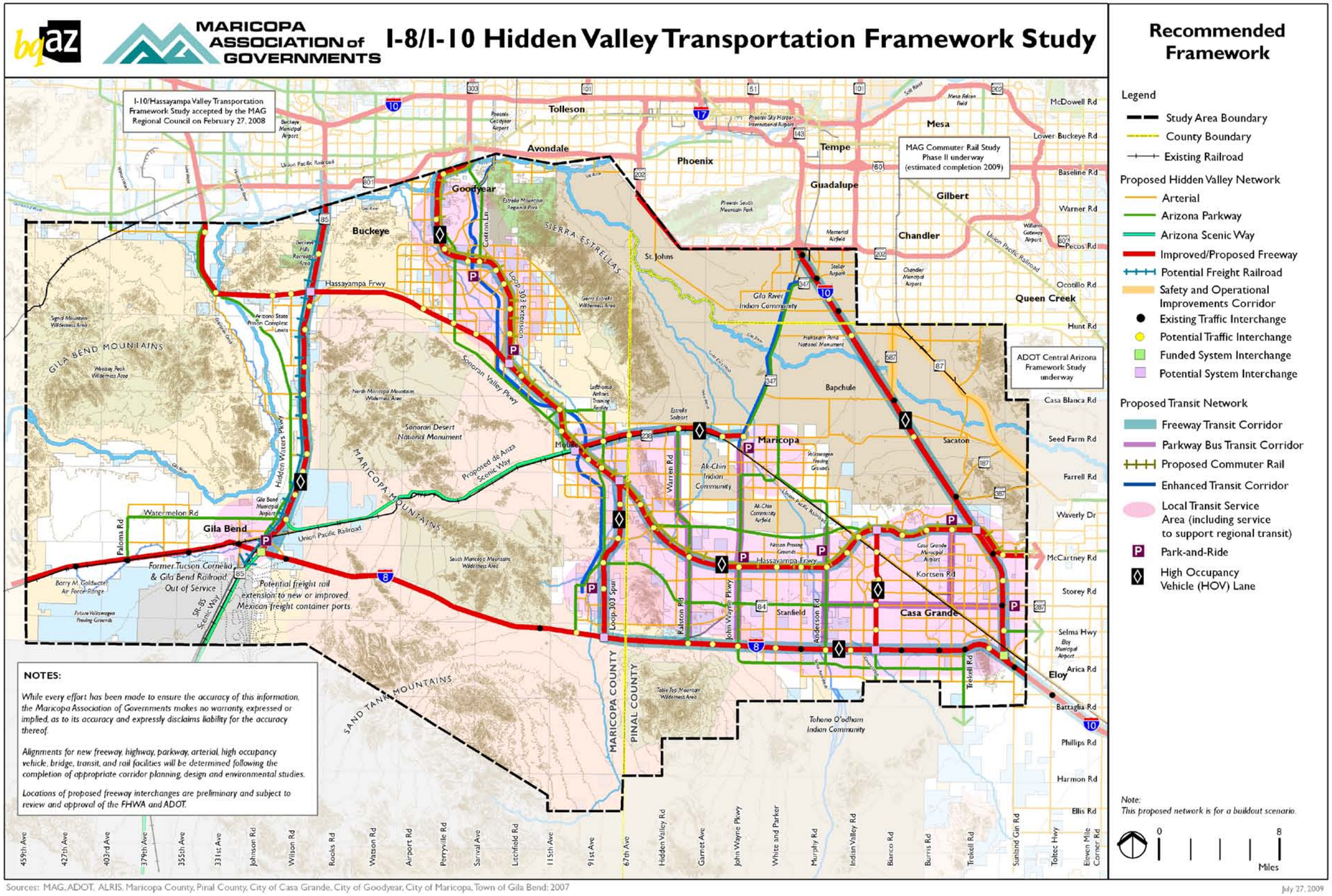


Table 6.1 Summary of Major Changes from Roadway Alternative A to Recommended Network

Roadway Name	Location	Description of Change	Reason for Change
		Freeways	
Hassayampa Freeway	Near Hidden Valley Road	Curvilinear alignment is smoothed out	Response to location of master-planned communities
Hassayampa Freeway	Montgomery Freeway to I-10	Alignment more closely follows Val Vista Road	Response to location of open pit mine
Hassayampa Freeway	East of I-10	Alignment more closely hugs I-10 to McCartney Road	Request from City of Casa Grande to minimize neighborhood encroachment
		Parkways	
Watermelon Road	Intersection with Paloma Road	Watermelon "Ts" into Paloma Road; Watermelon Road is discontinued past Paloma, which becomes a parkway	Response to changes in Paloma Ranch proposed network
Hidden Waters Parkway	Near Gila Bend	More closely follows SR-85	Move alignment to Old US-80 existing alignment
SR-85 Scenic Way	South of I-8	SR-85 Scenic Way intersects I-8 at existing system interchange location, not offset	Conform to ADOT current planning efforts to reconfigure SR-85/I-8 system interchange
North-South Parkway	South Goodyear; follows Waterman Wash	Removed	Limit crossings of Waterman Wash and wildlife crossings
Sonoran Parkway	Near Mobile	Reconfiguration of parkway and arterial alignments	Response to changes in Amaranth Master Plan proposed network
Cimarron Loop	Near I-8 and SR-303L Spur	Removed	Response to changes in master-planned community roadway network
SR-238	Hassayampa Freeway to SR-347	Upgraded to a freeway	Need for increased capacity
Smith Enke Road	SR-347 to White and Parker	Downgraded to an arterial	Request from City of Maricopa
Ralston Road	SR-238 to I-8	Alignment jogs to Warren Road from SR-238 to Papago Road	Request from City of Maricopa
SR-347	SR-238 to Farrell Road	Downgraded to an arterial	Request from City of Maricopa
Val Vista Road	Hassayampa Freeway to Hassayampa Freeway	Alignment smoothed out; terminates west of Montgomery Road	Request from City of Maricopa
Kortsen Road	SR-303L Spur (303S) to I-10	Downgraded to an arterial, with the exception of SR-303L Spur to approximately Hidden Valley Road	Move parkway alignment to SR-84 to accommodate more even spacing and capacity between the Hassayampa Freeway and I-8
SR-84	Ralston to Jimmie Kerr Boulevard	Classified entire length as a parkway	Move parkway alignment to SR-84 to accommodate more even spacing and capacity between the Hassayampa Freeway and I-8
McCartney Road	I-10 to Hassayampa Freeway	Downgraded to an arterial	Conform to Casa Grande SATS recommendations

Table 6.1-Continued

Roadway Name	Location	Description of Change	Reason for Change
Selma Parkway	I-10 to I-8	Downgraded to an arterial	Conform to Casa Grande SATS recommendations
Tabletop Parkway	Intersection with I-8	Intersection moved from White and Parker to SR-347	Conform to Pinal County RSRSM recommendations
		Arterials	
SR-347	I-10 to Hiller Road	Upgraded to a parkway	Need for increased capacity
County Line Road	SR-238 to Hassayampa Freeway	Upgraded to a parkway	Need for increased capacity
Farrell Road	SR-347 to Maricopa-Casa Grande Highway	Upgraded to a parkway	Need for increased capacity
White and Parker	Hiller to Maricopa-Casa Grande Highway	Upgraded to a parkway	Need for increased capacity
		Other Changes	
SR-587	Study area	Classified as a "safety and operational improvement corridor"	Request from GRIC
SR-87	Study area	Classified as a "safety and operational improvement corridor"	Request from GRIC
Proposed freight railroad	Parallel to SR-85	More closely follows SR-85; possible extension south of I-8	Consolidate right-of-way needs

Sources: AECOM and MAG, 2009

System and local service TIs are proposed for the locations listed below. Only one new TI, on I-10 at Chandler Heights Road, is funded in the MAG RTP. An asterisk (*) denotes an existing interchange. Milepost (MP) locations are shown for existing ADOT facilities.

SR-85

- Buckeye Hills Drive, (near milepost (MP) 144)
- Hassayampa Freeway, system TI (MP 141)
- Patterson Road (MP 138)
- Proposed TI (MP 136)
- Woods Road (MP 134)
- Proposed TI (near MP 133)
- Pierpont Road (MP 131)
- Gila Mountain Road (MP 128)
- De Anza Scenic Way (MP 122.5)
- I-8, proposed system TI

SR-303L Extension

- SR-801, proposed system TI
- Ray Road
- Willis Road
- Estrella Parkway
- Cotton Lane
- Queen Creek Road
- Ocotillo Road
- Riggs Road
- Patterson Road
- Hassayampa Freeway, proposed system TI

SR-303L Spur

- Hassayampa Freeway, proposed system TI
- Papago Road (approximate)
- Val Vista Parkway
- Kortsen Road Parkway
- Century Road (approximate)
- I-8, proposed system TI

Hassayampa Freeway

- Williams Field Road
- Old US-80
- Bruner Road
- Palo Verde Road
- SR-85, proposed system TI
- 195th Avenue
- Rainbow Valley Road
- Patterson Road
- SR-303L Extension, proposed system TI
- 139th Avenue (approximate)
- Sonoran Parkway
- Komatke Road
- SR-238/Maricopa Road
- Mahalia Road
- 83rd Avenue (approximate)
- SR-303L Spur, proposed system TI
- Papago Road (approximate)
- Val Vista Parkway
- Ralston Road Parkway
- Amarillo Valley Road
- SR-347
- White and Parker Road
- Stanfield Road
- Anderson Road Parkway
- Stanfield Road
- Indian Valley Road
- Maricopa-Casa Grande Highway
- Montgomery Road Freeway, proposed system TI
- Bianco Road
- Burris Road
- Pinal Avenue
- I-10, proposed system TI
- Woodruff Road

SR-238 Freeway

- Sonoran Valley Parkway
- County Line Road
- Warren Road
- Maricopa-Casa Grande Highway
- SR-347

Montgomery Road Freeway

- Hassayampa Freeway, proposed system TI
- Maricopa-Casa Grande Highway
- Kortsen Road Parkway
- SR-84
- Selma Highway Parkway
- I-8, proposed system TI

I-8

- Painted Rock Dam Road* (MP 102)
- Paloma Road* (MP 106)
- Citrus Valley Road* (MP 111)
- Pima Street* (MP 115)
- SR-85, proposed system TI (MP 117.5)
- Butterfield Trail/proposed SR-85 Scenic Way* (MP 119)
- Old Highway 84* (MP 140)
- Vekol Valley Road/Sonoran Valley Parkway* (MP 144)
- SR-303L Spur, proposed system TI (MP 146)
- SR-84* (MP 151)
- Ralston Road Parkway (MP 152.5)
- Amarillo Valley Road (MP 154.5)
- SR-347 (MP 156.5)
- White and Parker Road (MP 159.5)
- Stanfield Road* (MP 161)
- Anderson Road Parkway (MP 163.5)
- Indian Valley Road (MP 165.5)
- Montgomery Road Freeway, proposed system TI (MP 167)
- Bianco Road* (MP 169)
- Thornton Road* (MP 172)
- Trekell Road* (MP 174)
- Henness Road (MP 176)
- I-10 system TI* (MP 178)

I-10

- Wild Horse Pass* (MP 162)
- SR-347/Queen Creek Road* (MP 164)
- Chandler Heights Road (MP 166)
- Riggs Road* (MP 167)
- Goodyear Road (MP 170)
- SR-587/Casa Blanca Road* (MP 175)
- Seed Farm Road (MP 177)
- SR-187/SR-387* (MP 185)
- Hassayampa Freeway, proposed system TI (MP 188)
- McCartney Road* (MP 190)
- Kortsen Road (MP 193)
- SR-287* (MP 194)
- Selma Parkway (MP 197)
- I-8 system TI* (MP 199)—also listed under I-8
- Sunland Gin Road* (MP 200)

6.1.2 Performance and Comparison to Tier 2 Alternatives

Table 6.2 shows how the roadway portion of the recommended framework alternative performs with respect to the "safety and mobility" objectives (measures of effectiveness) used in the Tier 1 and Tier 2 evaluation of alternatives in Chapter 5. Eight measures of effectiveness are listed for both 2030 and Buildout conditions. As expected, the performance of the recommended roadway network deteriorates significantly from 2030 to Buildout. Overall, the major roadways across north-south and east-west cut-lines would operate near the boundary between level of service (LOS) E and LOS F at Buildout. This failure to meet the proposed minimum standard of LOS D underlines the importance of a comprehensive and effective transit system, as discussed in the next section.

Table 6.2 also compares the Buildout performance of the recommended alternative with the forecast performance of the four Tier 2 alternatives defined and evaluated in Chapter 5: A, A1, B and C2. The recommended network fares well in this comparison, ranking either first or second on all eight measures of effectiveness. Alternative B ranks slightly higher than the recommended alternative (57 percent versus 55 percent) on percent of daily VMT on freeways. With regard to V/C ratio across all north-south cut-lines, Alternative A1 does substantially better (a V/C of 0.74 instead of 0.95). Across east-west cut-lines, Alternative A has a slightly lower V/C ratio of 1.00.

Table 6.2 Performance of Recommended Roadway Framework and Comparison to Tier 2 Alternatives

Measure of Effectiveness	Performance of Recommended Framework Alternative		Rank at Buildout*
	Year 2030	Buildout	
Minimize daily VMT per lane mile	6,357	12,629	1
Maximize percent of daily VMT on freeways	53	55	2
Minimize percent of freeway lane miles operating daily at LOS E or worse	14	70	1
Minimize percent of lane miles on all facilities operating daily at LOS E or worse	5	29	1
Minimize the percent of congested (LOS E or F) daily VMT	17	56	1
Minimize the number of roadways with (daily) LOS E or F across all designated cut-lines	11	45	1
Minimize the V/C ratio across all designated north-south cut-lines	0.53	0.95	2
Minimize the V/C ratio across all designated east-west cut-lines	0.54	1.03	2 (tie)

*The recommended roadway framework is ranked against Tier 2 alternatives A, A1, B and C2. Thus its possible rank ranges from 1 (highest) to five (lowest).

Source: Wilson & Company, June 2009

6.1.3 Summary of Transit Elements

Public transportation will play a vital role in the Hidden Valley, improving circulation within communities while also providing modal and higher-capacity alternatives into the Phoenix and Tucson metropolitan areas. As the analysis in Chapter 4 demonstrated, the roadway system alone will be unable to meet all of the forecast demand at Buildout, even if the entire proposed network of freeways and parkways is constructed.

It is anticipated that at Buildout, both the Maricopa County and Pinal County portions of the Hidden Valley will have a level of transit service similar to that planned in the current MAG RTP for the existing urbanized area of Maricopa County. Figure 6-1 illustrates the recommended transit network together with the roadway network. The following transit elements belong to the recommended transportation framework:

- Local transit service (fixed-route bus and Americans with Disabilities Act (ADA) paratransit) in the urbanized areas of the Hidden Valley, including Maricopa, Casa Grande, south Goodyear and Gila Bend.
- An enhanced, generally north-south transit corridor in Goodyear, as envisioned in that city's long-range plans. The service may operate at least partly on a dedicated guideway. It might initially use rubber-tired vehicles, but then evolve to an urban rail technology depending on future funding and demand.
- An enhanced, generally north-south transit corridor along SR-347 between I-10 and SR-238. Some of the technology options are similar to those in the Goodyear corridor, but they would be more likely to include commuter/intercity rail than light rail or streetcar.
- Potential regional commuter service, most likely in the form of express buses. These corridors consist of freeway transit corridors (SR-85, SR-303L Extension, SR-303L Spur, SR-238, I-8, and I-10) and parkway bus transit corridors (Ralston/Warren, SR-347, Anderson, Pinal Avenue, and SR-84).
- High occupancy vehicle (HOV) lanes on all freeways--SR-85, SR-303L Extension, SR-303L Spur, SR-238, Hassayampa Freeway, Montgomery Road Freeway, I-8, and I-10--to minimize transit service delays due to traffic congestion.
- Several park-and-ride lots, with approximate locations shown in Figure 6-1.
- Potential commuter rail, following the SR-303L Extension through Goodyear and then the Hassayampa Freeway through Casa Grande. East of I-10, this route might connect with a Phoenix-Tucson passenger rail line in the Coolidge area. This alignment could become part of a larger commuter and intercity rail network that MAG and ADOT are currently studying.

6.1.4 Estimated Cost of Roadway and Transit Elements

Table 6.3 shows planning-level capital costs, in constant 2009 dollars, calculated for the recommended roadway network. Most of the unit costs are based on cost data for projects in the current editions of the MAG RTP and Transportation Improvement Program (TIP). RTP elements were used primarily for large projects such as freeways and system TIs, while the TIP was consulted for information on new and reconstructed arterials. Costs are similar to those used in the I-10/Hassayampa Valley Transportation Framework Study. All of the unit costs are likely to change substantially during subsequent planning and design concept work. They will also vary by location according to terrain, drainage, soil conditions, land use (urban or rural) and other characteristics.

Table 6.3 Derivation of Planning-Level Capital Cost*

Cost Element	Estimated Cost Per Unit	Source of Estimate
Lane Mile – Freeway**	$7.12 million	MAG RTP: SR-303L and SR-801
Lane Mile – Parkway***	$1.52 million	150% of arterial cost
Lane Mile – Arterial	$1.02 million	10 projects in MAG TIP and RTP
System TI (Freeway-Freeway)	$50.10 million	2 projects in RTP: SR-303L at I-17 and I-10
Freeway-Parkway TI	$30.50 million	Scaled down from freeway-freeway (system) TI
Parkway Grade Separation	$15.25 million	Scaled down from freeway-freeway (system) TI
Gila/Salt River Bridge	$20.33 million	Based on 2 projects in MAG TIP

*2009 dollars
**Includes local service TIs
***Includes all capital costs except for freeway-parkway TIs and parkway grade separations

Table 6.4 lays out the conceptual estimated costs of major transit elements at Buildout, with *rough* estimates of capital costs and annual operating costs for proposed commuter rail and freeway express transit corridors. Other proposed transit services, including local bus, are not included. Only the costs of infrastructure and services within the Hidden Valley study area are included. Thus, the table reflects only part of the cost of transit that connects the Hidden Valley with the Phoenix and Tucson metropolitan areas. ***All costs are highly speculative, as they are based on assumptions about future levels of transit service that may not be fully implemented for several decades.***

Table 6.4 Conceptual Transit Costs (2009 $)

Transit Element	Estimated Capital Cost	Estimated Operating & Maintenance Cost per Year
Commuter Rail	$1.3 billion	$25 million
Freeway Transit Corridors	$10 million	$2 million

All costs are in 2009 dollars. HOV lanes are included in roadway capital cost.

Sources: ADOT (cost estimates compiled for Statewide Frameworks), MAG (Commuter Rail Strategic Plan), and Florida Department of Transportation

Table 6.5 outlines the estimated costs of major corridor roadway segments. MAG defined the segments to be consistent with segmentation of the regional freeway system in Maricopa County. The costs presented in this table are for construction of lane miles and local service TIs on freeways. The total capital cost estimate for the recommended roadway network is approximately $21.3 billion, distributed as follows:

- Freeways--$14.9 billion: 1,960 freeway lane miles, seven system TIs, and one major river crossing. (70 percent of the cost for 27 percent of the lane miles.)
- Parkways--$2.7 billion: 1,703 parkway lane miles, and ten parkway-parkway grade separations. (13 percent of the cost for 23 percent of the lane miles.)
- Arterials--$3.7 billion: 3,668 arterial lane miles. (17 percent of the cost for 50 percent of the lane miles.)

Table 6.5 Planning-Level Capital Cost by Corridor-Specific Roadway Segment

Roadway	From	To	Facility Type	Lane Miles	Capital Cost (millions)
Hassayampa Freeway	Picacho Vista Freeway	I-10	Freeway	98.91	$704.24
Hassayampa Freeway	I-10	Maricopa-Casa Grande Highway	Freeway	95.25	$678.18
Hassayampa Freeway	Maricopa-Casa Grande Highway	SR-347	Freeway	83.76	$596.37
Hassayampa Freeway	SR-347	SR-303S (303 Spur)	Freeway	97.8	$696.34
Hassayampa Freeway	SR-303S (303 Spur)	SR-303L	Freeway	129.9	$924.89
Hassayampa Freeway	SR-303L	SR-85	Freeway	103.92	$739.91
Hassayampa Freeway	SR-85	Southern Ave	Freeway	116.64	$830.48
Hassayampa Freeway	Southern Ave	I-10	Freeway	48.84	$347.74
SR-85 Freeway	I-8	Maricopa Scenic Way	Freeway	7.32	$52.12
SR-85 Freeway	Maricopa Scenic Way	Hassayampa Freeway	Freeway	80.5	$573.16
SR-85 Freeway	Hassayampa Freeway	SR-801	Freeway	50.88	$362.27
SR-85 Freeway	SR-801	I-10	Freeway	35.4	$252.05
SR-303L (Estrella Fwy Extension)	Hassayampa Freeway	Cotton Lane	Freeway	75.6	$538.27
SR-303L (Estrella Fwy Extension)	Cotton Lane	SR-801	Freeway	97.56	$694.63
SR-303L (Estrella Fwy Extension)	SR-801	I-10	Freeway	37.72	$268.57
SR-303S (303 Spur)	I-8	Hassayampa Freeway	Freeway	46.64	$332.08
Watermelon Road	Paloma Road	Citrus Valley Road	Parkway	19.56	$29.73
Watermelon Road	Citrus Valley Road	Gila Blvd	Parkway	16.08	$24.44
Watermelon Road	Gila Blvd	Hidden Waters Parkway	Parkway	11.24	$17.08
Hidden Waters Parkway	Maricopa Scenic Way	Watermelon Road	Parkway	3.2	$4.86
Hidden Waters Parkway	Watermelon Road	Woods Road	Parkway	41.04	$62.38

Table 6.4-Continued

Roadway	From	To	Facility Type	Lane Miles	Capital Cost (millions)
Hidden Waters Parkway	Woods Road	Gillespie Dam	Parkway	21.68	$32.95
Hidden Waters Parkway	Gillespie Dam	SR-801	Parkway	61.12	$92.90
Hidden Waters Parkway	SR-801	I-10	Parkway	46.44	$70.59
Sonoran Valley-Rainbow Valley Roads	SR-238	Casa Blanca Road	Parkway	19.38	$29.46
Sonoran Valley-Rainbow Valley Roads	Casa Blanca Road	Dysart Road	Parkway	17.12	$26.02
Sonoran Valley-Rainbow Valley Roads	Dysart Road	Hassayampa Freeway	Parkway	53.7	$81.62
Sonoran Valley-Rainbow Valley Roads	Hassayampa Freeway	Queen Creek Road	Parkway	14.22	$21.61
Sonoran Valley-Rainbow Valley Roads	Queen Creek Road	SR-303L	Parkway	36.78	$55.91
Vekol Valley Parkway	I-8	Peters Road	Parkway	19.02	$28.91
Vekol Valley Parkway	Peters Road	Barnes Road	Parkway	37.44	$56.91
Vekol Valley Parkway	Barnes Road	Hassayampa Freeway	Parkway	40.32	$61.29
Vekol Valley Parkway	Hassayampa Freeway	SR-238	Parkway	12.24	$18.60
Vekol Valley Parkway	SR-238	Hassayampa Freeway	Parkway	29.76	$45.24
Countyline Parkway	Hassayampa Freeway	SR-238	Parkway	28.26	$42.96
Warren Road-Ralston Road	Selma Highway	Barnes Road	Parkway	15.06	$22.89
Warren Road-Ralston Road	Barnes Road	Hassayampa Freeway	Parkway	13.68	$20.79
Warren Road-Ralston Road	Hassyampa Freeway	SR-238	Parkway	55.86	$84.91
SR-347	I-8	SR-84	Parkway	23.12	$35.14
SR-347	SR-84	Barnes Road	Parkway	22.16	$33.68
SR-347	Barnes Road	Hassayampa Freeway	Parkway	3.68	$5.59
SR-347	Hassayampa Freeway	Val Vista Road	Parkway	21.6	$32.83

Table 6.4-Continued

Roadway	From	To	Facility Type	Lane Miles	Capital Cost (millions)
SR-347	Val Vista Road	Farrell Road	Parkway	27.66	$42.04
SR-347	Farrell Road	Maricopa-Casa Grande Highway	Major Arterial	11.76	$12.00
SR-347	Maricopa-Casa Grande Highway	SR-238	Parkway	6.18	$9.39
SR-347	SR-238	Hiller Road	Parkway	9.44	$14.35
SR-347	Hiller Road	Riggs Road	Parkway	57.42	$87.28
Murphy-Smith Enke Loop	Maricopa-Casa Grande Highway	Honeycut Road	Major Arterial	14.16	$14.44
Murphy-Smith Enke Loop	Honeycut Road	SR-238/SR-347	Major Arterial	27.56	$28.11
Anderson Road	I-8	SR-84	Parkway	28.4	$43.17
Anderson Road	SR-84	Kortsen Road	Parkway	15.76	$23.96
Anderson Road	Kortsen Road	Hassayampa Freeway	Parkway	8.4	$12.77
Anderson Road	Hassayampa Freeway	Maricopa-Casa Grande Highway	Parkway	45.84	$69.68
Kortsen Road	Vekol Valley Parkway	SR-303S (303 Spur)	Parkway	2.1	$3.19
Kortsen Road	SR-303S (303 Spur)	Warren Road	Parkway	45.3	$68.86
Kortsen Road	Warren Road	SR-347	Major Arterial	15.76	$16.08
Kortsen Road	SR-347	Anderson Road	Major Arterial	42	$42.84
Kortsen Road	Anderson Road	Montgomery Road	Major Arterial	26.16	$26.68
Kortsen Road	Montgomery Road	Pinal Ave (SR-387)	Major Arterial	34.32	$35.01
Kortsen Road	Pinal Ave (SR-387)	I-10	Major Arterial	15.72	$16.03
SR-238	Sonoran Valley Parkway	Hassayampa Freeway	Parkway	7.14	$10.85
SR-238	Hassayampa Freeway	Vekol Valley Parkway	Freeway	13.59	$96.76
SR-238	Vekol Valley Parkway	Countyline Parkway	Freeway	12.6	$89.71

Table 6.4-Continued

Roadway	From	To	Facility Type	Lane Miles	Capital Cost (millions)
SR-238	Countyline Parkway	Warren Road	Freeway	23.67	$168.53
SR-238	Warren Road	SR-347	Freeway	43.04	$306.44
SR-238	SR-347	White and Parker Road	Parkway	25.44	$38.67
SR-238	White and Parker Road	Anderson Road	Parkway	36.64	$55.69
SR-238	Anderson Road	Hassayampa Freeway	Major Arterial	16.74	$17.07
Florence Blvd/SR-84/SR-287	I-8	SR-347	Major Arterial	34.62	$35.31
Florence Blvd/SR-84/SR-287	SR-347	Montgomery Road	Parkway	88.08	$133.88
Florence Blvd/SR-84/SR-287	Montgomery Road	Pinal Ave (SR-387)	Parkway	48.08	$73.08
Florence Blvd/SR-84/SR-287	Pinal Ave (SR-387)	I-10	Major Arterial	24	$24.48
Montgomery Road	I-8	Kortsen Road	Freeway	31.92	$227.27
Montgomery Road	Kortsen Road	Hassayampa Freeway	Freeway	21.57	$153.58
Hombre de Agua	Cotton Lane	Sonoran Valley Parkway	Major Arterial	62.04	$63.28
I-8	Paloma Road	SR-85	Freeway	46.26	$329.37
I-8	SR-85	SR-303 Spur	Freeway	113.4	$807.41
I-8	SR-303 Spur	SR-347	Freeway	64.17	$456.89
I-8	SR-347	Anderson Road	Freeway	41.79	$297.54
I-8	Anderson Road	Montgomery Road	Freeway	24.39	$173.66
I-8	Montgomery Road	Trekell Road	Freeway	41.85	$297.97
I-8	Trekell Road	I-10	Freeway	17.7	$126.02
I-10	Riggs Road	Casa Blanca Road	Freeway	68.84	$490.14
I-10	Casa Blanca Road	SR-387/Pinal Ave	Freeway	73.64	$524.32

Table 6.4-Continued

Roadway	From	To	Facility Type	Lane Miles	Capital Cost (millions)
I-10	SR-387/Pinal Ave	Hassayampa Freeway	Freeway	26.4	$187.97
I-10	Hassayampa Freeway	Kortsen Road	Freeway	38.84	$276.54
I-10	Kortsen Road	Selma Highway	Freeway	32.88	$234.11
I-10	Selma Highway	I-8	Freeway	17.16	$122.18
I-10	I-8	Toltec Road	Freeway	42.48	$302.46

Source: MAG Buildout final travel demand model run, dated 04/25/09.

Notes:
1. Average volume on a segment is calculated by dividing total VMT by length of segment.
2. Shading Indicates Buildout daily volume estimates for segments of Hidden Waters Parkway within the I-10/Hassayampa Valley Transportation Framework study area based on Hassayampa Valley Buildout volumes on framework network (both Hidden Valley and Hassayampa frameworks), dated 9/30/08

6.2 Potential Development Timeframes for High-Capacity Transportation Network

Table 6.6 lists potential timeframes for development (right-of-way preservation, planning, design and construction) of the proposed high-capacity transportation facilities—primarily freeways and parkways. Because this is a very long-range plan that would be fully implemented only at Buildout (at least several decades in the future), the timeframes represent periods of five to ten years. In every case, right-of-way preservation should begin relatively early, before development drives up the price of land and necessitates extensive displacement of residents, businesses and institutions. The priorities in the table are based not only on the traffic modeling results, but also on the many interviews and meetings with Funding Partners, Study Review Team members, and other stakeholders throughout the area ***Table 6.6 is intended as one reasonable scenario for phased implementation of the high-capacity transportation system, rather than as a directive or blueprint for further action.*** The scenario is meant to stimulate thought and serve as a starting point for further planning efforts by local governments, the state of Arizona and regional planning organizations.

All of the timeframes are also subject to change depending on the results of other current and pending studies, such as the MAG Commuter Rail System Study (covering the entire Hidden Valley study area), the ADOT alternatives analysis for passenger rail in the Phoenix-Tucson corridor, the Pinal County Transit Feasibility & Implementation Study, and the GRIC Small Area Transportation Study.

At the request of the Funding Partners and to reflect travel demand forecasts, the study team assumed that all freeways would have at least six general purpose lanes and two HOV lanes (one per direction) at Buildout. All parkways, except the designated scenic ways, will ultimately be built to a six- or eight-lane cross-section. Some facilities would be constructed as interim parkways by 2030, and then further upgraded to a freeway at Buildout. The study team also classified parkways as high, medium or low priority based on the expected timing of future capacity needs as well as the intrinsic importance of each facility in the network. For example, SR-347 ranks as a high priority for upgrade to a parkway because it currently offers the only direct connection between Maricopa and Phoenix area, and because it links two Interstate highways with each other and with the Ak-Chin Indian Community. On the other hand, the Watermelon/Paloma, Tabletop and Hidden Waters parkways receive lower priority because they more or less parallel higher-level facilities near the edges of the study area.

It is important to emphasize that none of the recommended elements in Table 6.6 are currently funded, except for capacity improvements to I-10 from SR-202L to Riggs Road. Future implementation will require the identification and enactment of new sources of transportation funding. Chapter 7 describes the context and presents a menu of options for financially supporting roadways and transit.

6.3 Potential Responsibilities for Implementation

This section briefly describes potential responsibilities for implementation of the conceptual roadway framework in the Hidden Valley. Implementation includes right-of-way preservation, construction, and operations and maintenance of the completed facilities. Because transportation funding is a complex topic and a prerequisite to implementation, Chapter 7 addresses it in detail.

Table 6.6 Potential Hidden Valley Transportation Framework Development Timeframe

Freeway	Segment	Corridor/Prelim. Alignment Study	Right-of-Way Preservation	Facility Level of Development*	
				Interim (2030)	Buildout
I-8	I-10 to SR-347	N/A	2010-2015 (for new TIs)	6 lanes (general purpose)	10 lanes including 2 HOV, and several new TIs
	West of SR-347			4 lanes (existing)	
I-10**	SR-202L to I-8	N/A	2010-2015 (for new TIs)	6 lanes (general purpose)	10 lanes including 2 HOV, and new TIs
SR-85	I-8 to I-10	Complete	Complete	4 lanes (general purpose)	8 lanes including 2 HOV
SR-303L Extension	I-10 to Rainbow Valley Rd.	2010-2015	2010-2020	6 lanes (general purpose)	8 lanes including 2 HOV
	Rainbow Valley Rd. to Hassayampa Fwy.	2010-2020	2015-2020	4 lanes (general purpose)	
SR-303S (spur)	Hassayampa Fwy. to I-8	2010-2020	2015-2020	6-lane *parkway*	8 lanes including 2 HOV
Hassayampa Fwy.	I-10 (Casa Grande) to I-10 (Buckeye)	2010-2015	2010-2020	6 lanes (general purpose)	8 lanes including 2 HOV
SR-238	Hassayampa Fwy. to SR-347	2010-2015	2015-2020	4 lanes (general purpose)	8 lanes including 2 HOV
Montgomery Fwy	I-8 to Hassayampa Fwy.	2020-2025	2020-2030	4 lanes (general purpose)	8 lanes including 2 HOV
Parkway	**Segment**	**Corridor/Prelim. Alignment Study**	**Right-of-Way Preservation**	**Facility Level of Development***	
				Interim (2030)	**Buildout**
SR-347**[H]	I-10 to Maricopa-CG Hwy.	N/A	2010-2020	6 lanes	6 lanes
	Farrell Rd. to I-8			4 lanes	8 lanes
Sonoran Valley[H]	SR-238 to SR-303L	2010-2015	2010-2020	4 lanes	6 lanes
Warren-Ralston[H]	I-8 to SR-238	2010-2015	2010-2020	4 lanes	8 lanes
Anderson[H]	SR-84 to Maricopa-CG Hwy.	2010-2015	2010-2020	4 lanes	8 lanes
Anderson[M]	I-8 to SR-84	2015-2020	2015-2025	4 lanes	6 lanes
Cotton Ln[H]	SR-303L to SR-303L	2010-2015	2010-2020	4 lanes	6 lanes
Kortsen/SR-84/SR-287[M]	Montgomery to SR-303S	2015-2020	2015-2025	4 lanes	6 lanes
Maricopa-CG Hwy.[M]	All (parkway portion)	2010-2020	2015-2025	6 lanes	6 lanes
Farrell[M]	All (parkway portion)	2010-2020	2015-2025	4 lanes	6 lanes
Val Vista[M]	Hass. Fwy. to Hass. Fwy.	2010-2020	2015-2025	4 lanes	6 lanes

Table 6.6-Continued

Freeway	Segment	Corridor/Prelim. Alignment Study	Right-of-Way Preservation	Facility Level of Development*	
				Interim (2030)	Buildout
Selma[M]	East of I-10	2010-2020	2015-2025	6 lanes	6 lanes
Trekell[M]	South of I-8	2010-2020	2015-2025	4 lanes	6 lanes
Vekol Valley[M]	I-8 to Hassayampa Fwy.	2010-2020	2015-2025	4 lanes	6 lanes
Hidden Waters[L]	Gila Bend to I-10	2015-2025	2020-2030	2 lanes	6 lanes
Tabletop[L]	SR-347 to Trekell	2015-2025	2020-2030	4 lanes	6 lanes
Watermelon/Paloma[L]	I-8 to Hidden Waters	2015-2025	2020-2030	2 lanes	8 lanes
SR-85 Scenic Way	South of I-8	N/A	Post 2030	2-lane arterial (no change)	4-lane scenic way
De Anza Scenic Way	SR-238 to SR-85	N/A	Post 2030	2-lane arterial (no change)	4-lane scenic way
Regional Transit	**Segment**	**Corridor/Prelim. Alignment Study**	**Right-of-Way Preservation**	**Facility Level of Development***	
				Interim (2030)	**Buildout**
Passenger Rail	Queen Creek-Eloy (UP Phoenix Division)	2010-2015	2010-2020	Peak period service	Full service
	SR-303L/Hassayampa Fwy. corridor	In conjunction with Hass. Fwy. studies	2015-2025	Limited or no service	
Regional Bus	All	N/A	N/A	Based on demand	Based on demand

*Refers to total lanes in both directions.
**All transportation improvements on tribal community land require advance authorization from the tribal governing council.
Parkway priorities: [H]High
[M]Medium
[L]Low

Freeways

Construction, operations, and maintenance of both urban and rural freeways in Arizona have traditionally been the responsibility of ADOT, although the funding may come from local sources like the half-cent sales tax in Maricopa County that funds the MAG RTP. Since freeways are facilities for uninterrupted travel that typically cross multiple jurisdictional boundaries, the obvious candidate for construction, operation and maintenance of Hidden Valley freeways is either ADOT or some form of regional transportation authority. Future controlled-access highways, whether "free" or tolled, could also be constructed and operated under some type of public-private partnership involving either ADOT or a new regional authority.

If built as envisioned, the Hassayampa Freeway would provide a critical new route linking central Pinal County to western Maricopa County, and potentially connecting to Las Vegas via US 93. It would provide benefits by relieving congestion elsewhere, accommodating economic development in the project area, serving as a bypass of the congested Phoenix metropolitan area, and reducing travel costs for freight carriers. This broad range of benefits opens the door to innovative funding strategies, particularly public-private partnerships (PPP) that spread the risks and rewards of the large-scale investment.

Today Arizona relies almost completely on public funds to build and maintain its surface transportation system. Unfortunately, as Chapter 7 explains, transportation funding is shrinking for several reasons. The Arizona legislature is currently (June 2009) considering legislation that will open the door to private investment, while retaining governmental monitoring and accountability by the private investors. The proposed legislation allows ADOT (and other jurisdictions acting through ADOT) to enter into PPP agreements for eligible facilities, which could be built by a wide range of delivery methods. ADOT would use its powers to help obtain right-of-way and enforce terms of the agreement, and take over ownership, if needed.

Public-private partnerships are not a cure-all, and each proposal must be evaluated individually because there are many tradeoffs. Private-sector investment in roads helps conserve public funding for other projects and avoids the up-front costs of governmental borrowing. They can also provide mobility benefits, user pricing that reflects the true costs, incentives for drivers to consider costs, and congestion pricing to alleviate peak congestion. A recent report by the Government Accountability Office states that "[T]here is no 'free' money in public-private partnerships. They are potentially more costly to the public and it is likely that tolls on a privately operated highway will increase to a greater extent than they would on a publicly operated toll road. There is also the risk of tolls being set that exceed the costs of the facility, including a reasonable rate of return, should a private concessionaire gain market power because of the lack of viable travel alternatives."

Once the economy recovers, the Hassayampa Freeway project may be rewarding to public agencies and private interests working as partners. All major freeway corridors have very long lead times for implementation, so it is important to consider project funding from concept through construction and operation. For the Hassayampa Freeway, PPP should be objectively considered as the project advances through detailed planning, design, and environmental analysis.

Preservation of right-of-way in future freeway corridors will require a cooperative effort among all of the jurisdictions that the freeway will traverse, including cities, towns, Maricopa County, and Pinal County.

Parkways

The parkway, as Chapter 5 describes it, is a new type of facility for Arizona. While some jurisdictions (e.g., Town of Buckeye, City of Surprise) have incorporated parkways into their plans following the recommendations of the Hassayampa Valley Framework Study, none have yet been built. The Maricopa County Department of Transportation (MCDOT) has led a multi-agency effort to establish common guidelines for parkway design in Arizona. However, there is no local precedent for implementation, and any of a variety of agencies could assume responsibility for part or all of the process.

Responsibility or authority for implementing this facility could be vested in the two counties, the Hidden Valley municipalities, a possible regional authority, or some combination. While ADOT may remain responsible for constructing and maintaining freeways throughout central Arizona, the state legislature could establish a new regional parkway authority. Major ADOT involvement in parkway implementation appears unlikely without

legislation expansion of that agency's mission, accompanied by additional funding. Existing state highways that ADOT upgrades to parkways may be an exception.

Cities and towns will play an important role in working to preserve right-of-way for future parkways within their corporate boundaries. They may also operate and maintain parkways if adequate funding is available. It may be desirable, however, to charge a single agency (or one in each county) with planning, designing, and constructing the parkways as a uniform system with consistent design standards – in a manner analogous to ADOT's current responsibility for the regional freeway system. Such an agency would also require a stable source of funding.

The Pinal County *Regionally Significant Routes Plan for Safety and Mobility (RSRSM)* study outlines a method for implementation of its recommendations, adopted by the board of supervisors, that includes freeways, parkways, and arterials. This process includes the following steps:

- Adopt the corridor preservation map (Pinal County Board of Supervisors)
- Establish a Regional Implementation Committee to coordinate implementation of the Regionally Significant Routes (RSR).
- Implement an early alert process whereby Pinal County will incorporate right-of-way for the RSR into the Development Review and Capital Improvement Planning procedures.
- Coordinate land use development and preserve right-of-way for RSR.
- Adopt the *RSRSM Access Management Manual.*
- Conduct training and outreach sessions on the benefits and implementation of access management.
- Continuously monitor and update the RSRSM plan.

Coordination with the Regional Implementation Committee in Pinal County will be important in realizing a comprehensive parkway system for the Hidden Valley area across both counties.

Arterials

With the rapid expansion of development into outlying portions of the Phoenix metropolitan area, private developers are increasingly expected and asked to pay for new arterials. This pattern will most likely intensify in the Hidden Valley, where much new development will take the form of master-planned communities with their own street networks that will need to connect seamlessly with external arterials. The private financial contributions may be in kind (e.g., dedication of right-of-way) as well as in cash. Actual construction, operation, and maintenance of arterials is typically the responsibility of MCDOT or Pinal County Public Works (in unincorporated areas) or the appropriate municipality – with or without a financial infusion from developers. In some cases, developers have constructed roadways to county or municipal standards to provide access to their communities, and then turned them over to the city or county for operation and maintenance.

As the demand for new roadways in the Hidden Valley continues to grow, MCDOT and Pinal County Public Works will be increasingly hard-pressed to construct new roadways in currently unincorporated areas that cities or towns will eventually annex. In effect, the county is expected to pay for roads that will benefit primarily the residents of incorporated communities in the future. This concern is not new or unique to the Hidden Valley, but it will become more critical as the gap between needs and resources widens.

Summary, Including Transit

Table 6.7 summarizes the types of entities (both public and private) and levels of government that might take responsibility for implementation of the recommended transportation framework illustrated in Figure 6-1, including regional transit improvements. ***The table is not intended to be exhaustive, but only to list some of the more obvious candidates.*** Implementation responsibilities may vary by time, place, and phase; e.g., one entity might be responsible for right-of-way preservation, a second for construction, and a third for operations and maintenance (e.g., of a parkway).

No regional transportation agency with the authority or funding to do any of the things listed in Table 6.7 currently exists. Only the state legislature can establish such an agency and specify its powers. For example,

depending on its statutory authority, a regional authority might or might not have the power of eminent domain or the ability to levy taxes and fees. A future transportation authority might be a completely new agency, or its functions might be grafted onto an existing agency such as MAG, CAAG, or the two counties under an intergovernmental agreement.

Table 6.7 Examples of Possible Roadway Responsibilities by Functional Class

Classification	Potentially Responsible Source, Agency or Other Agency		
	Funding (sources)	Implementation	
		Right-of-Way Preservation	Construction, Operations and Maintenance
Freeways (including HOV lanes)	Statewide Countywide Federal	Maricopa County Pinal County Cities/towns Regional transportation authority*	ADOT Regional transportation authority*
Parkways	Countywide Cities/Towns Landowners/ Developers**	Maricopa County Pinal County Cities/Towns Regional transportation authority*	Regional Transportation authority* Maricopa County Pinal County Cities/Towns***
Arterials	Cities/Towns Landowners/ Developers	Maricopa County Pinal County Cities/towns	Maricopa County Pinal County Cities/towns
Passenger Rail****	Statewide Countywide Regional Federal	ADOT Regional transportation authority* Local jurisdictions	Regional transportation authority* Rail operating authority*
Regional Bus	(same as rail)	N/A	Regional transportation authority* Counties, cities, towns

*Hypothetical organization; would need to be established by the state legislature.
**Includes land and other in-kind contributions
***Operations and maintenance
****Roles and responsibilities to be further explored in current *Statewide Rail Framework* (ADOT)

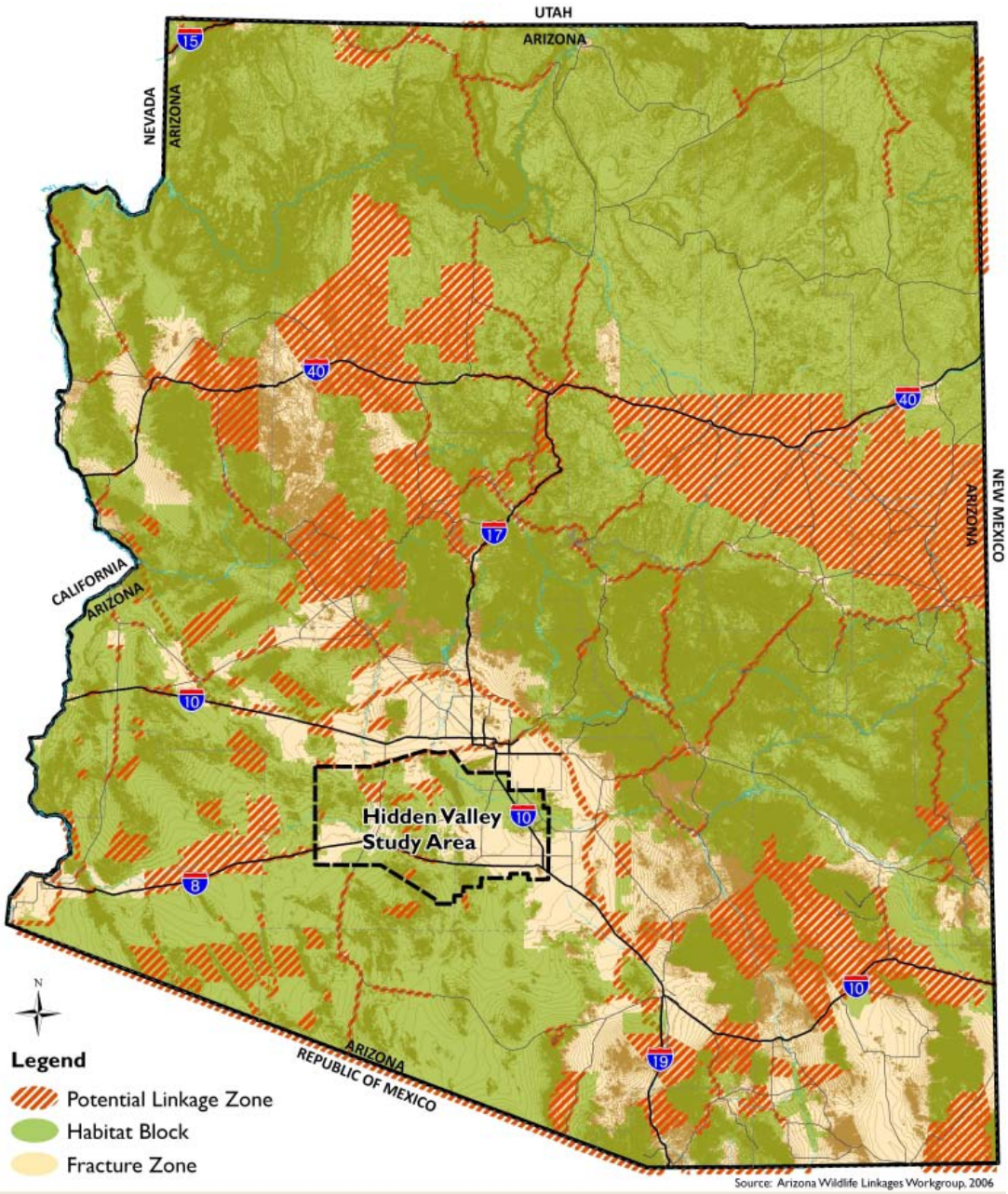
Source: MAG Project Team, June 2009

6.4 Other Important Planning Considerations

6.4.1 Wildlife Corridors and Crossings of Transportation Facilities

The Arizona Wildlife Linkages Workgroup, a partnership of public agencies and non-governmental organizations, recently completed a study known as *Arizona's Wildlife Linkages Assessment*. The assessment documented and mapped initial work to identify habitat blocks, fracture zones, and potential linkage zones, in an effort to promote connectivity of habitat for Arizona's wildlife. The assessment is intended to provide a framework for land managers and planners to assess opportunities for mitigation, such as wildlife crossings and land protection measures (Figure 6-2).

Figure 6-2 Arizona Wildlife Linkages Assessment



Habitat blocks are areas that consist of important wildlife habitat and can reasonably be expected to remain wild for at least 50 years. These habitat blocks are mainly composed of publicly-owned or managed lands within areas such as national forests, national parks, national wildlife refuges, large military reservations, tribal lands, and lands managed by the Bureau of Land Management or Bureau of Reclamation. Habitat blocks also include private lands that are managed for conservation by private organizations such as The Nature Conservancy, as well as some privately owned ranches that are committed to long-term conservation.

Fracture zones are areas between habitat blocks that provide barriers or challenges to wildlife connectivity. These regions are largely Arizona State Trust land, private holdings and transportation corridors. Roads, canals, urban

areas, railroads and border security operations limit or prevent animal movement, or threaten to do so, in these zones. These fracture zones generally need some sort of restoration to function as reliable wildlife linkages.

Potential linkage zones are portions or subsets of the fracture zone or habitat block, identified as areas critical to wildlife movement and connectivity. Threats must be managed if connectivity is to be maintained or restored.

Mitigation measures, such as grade-separated wildlife crossings, are important for two reasons. The first is human safety. As our infrastructure expands into more rural areas, people and their vehicles are increasingly moving into wildlife habitat, increasing the chances of wildlife-vehicle collisions. Second, wildlife crossings reduce the adverse effects of roads, decreasing wildlife mortality and preventing species from approaching a status that would warrant listing under the Endangered Species Act.

A follow-on program to *Arizona's Wildlife Linkages Assessment,* the Arizona Missing Linkages completed by the Arizona Game and Fish Department, assesses more specific regions to determine these wildlife crossing needs. A report completed in the Hidden Valley study area, the *Gila Bend-Sierra Estrella Linkage Design*, identifies the two most important linkages in the study area – the connection across SR-85 between the Gila Bend Mountains and the Sonoran Desert National Monument, and the connection across the proposed Hassayampa Freeway between the Sonoran Desert National Monument and the Sierra Estrella Wilderness Area. Both of these areas (Figure 6-3) include a range of species size: small (e.g., desert tortoise), medium (e.g., javelina), and large (e.g., desert bighorn sheep) for which wildlife crossings should include appropriate infrastructure. For example, a bridge or box culvert with a large opening attracts larger species, whereas low pipe or box culverts with smaller openings are more attractive to small and medium animals. In both situations, fencing is necessary to guide the animals into the crossing, and not over the road. Figures 6-4, 6-5, and 6-6 illustrate a sample cross-section, plan view, and elevation drawing for a potential large mammal box culvert wildlife crossing on a parkway. This cross-section can easily be adapted to a freeway or arterial by varying the dimensions of the culvert opening in relation to the roadway width. Additionally, depending on the animal size, the box culvert can be replaced with a pipe culvert or other appropriate pathway, which may use an overpass rather than an underpass. The illustrations merely provide examples of a possible wildlife crossing in Hidden Valley area.

Several wildlife crossings are planned or exist in Arizona and offer examples of alternative mitigation measures. For example, to accommodate desert bighorn sheep on US-93, three wildlife bridges will be constructed over the highway, to appeal to the sheep's desire to be up high. On the other hand, eleven underpasses were constructed on a 17-mile section of SR-260 between Payson and Show Low, permitting elk to cross the highway after over 100 documented wildlife-vehicle collisions in 2001. Mitigation measures included elk crossing signs along SR-260 between Payson and Show Low and pedestrian-wildlife underpasses with monitoring equipment. Since implementation of these crossings on SR-260, elk-vehicle collisions have fallen as much as 95 percent. Near Superior along the Gonzales Pass segment of US-60, concrete ramps have been constructed at the entrance of each culvert to help tortoises avoid slipping between the riprap entrances to culverts. The ramp guarantees the animals a pathway up to and into the culvert.

Protection of significant wildlife crossings is an important element of this study. Appropriate mitigation measures should be included in future design of the recommended roadways, especially scenic ways.

Artist rendition of a bighorn sheep crossing over US-93

Desert tortoise ramp under US-60 near Superior

Elk crossing area along SR-260 between Payson and Show Low

Figure 6-3 Missing Linkages

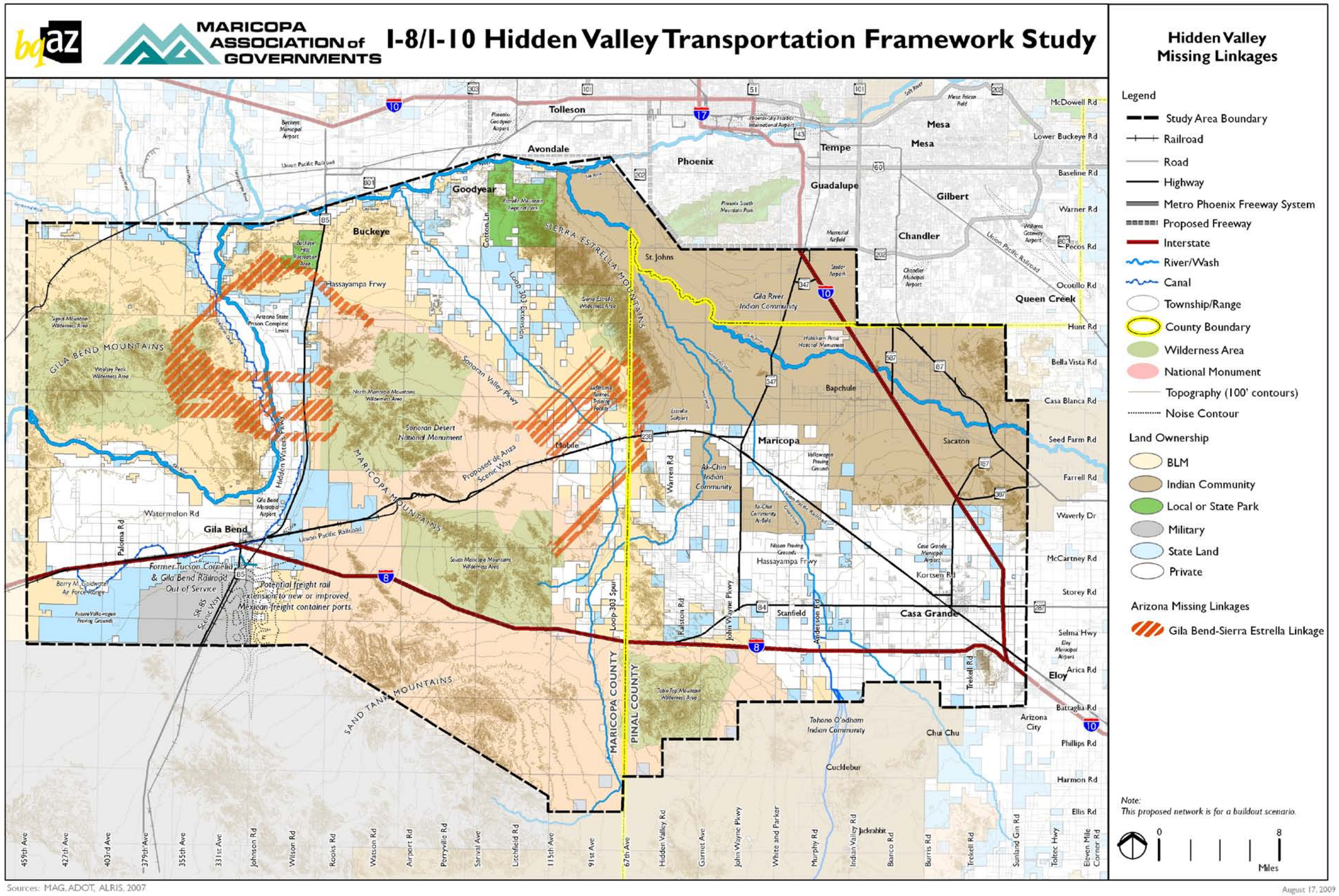
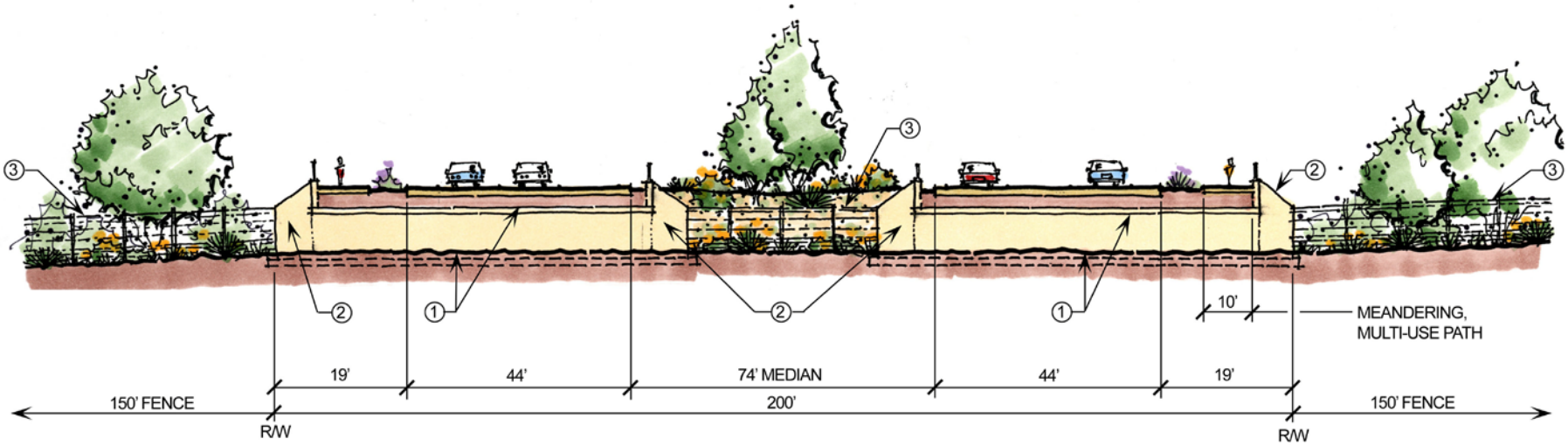


Figure 6-4 Sample Cross Section – Large Mammal Wildlife Crossing, Arizona Parkway



① 8' HT. x 8' WIDE x 70' CONCRETE BOX CULVERT WITH NATURAL DIRT FLOOR.

② CONCRETE HEADWALLS, WINGWALLS AND BARRIER RAILING.

③ 8' HT. WIRE FENCE, 150' LONG, FLARED/ANGLED TO FUNNEL WILDLIFE TO CULVERT.

ARIZONA PARKWAY

LARGE MAMMAL WILDLIFE CROSSING
CROSS SECTION

SCALE: 1" = 20'

Figure 6-5 Sample Plan View – Large Mammal Wildlife Crossing, Arizona Parkway

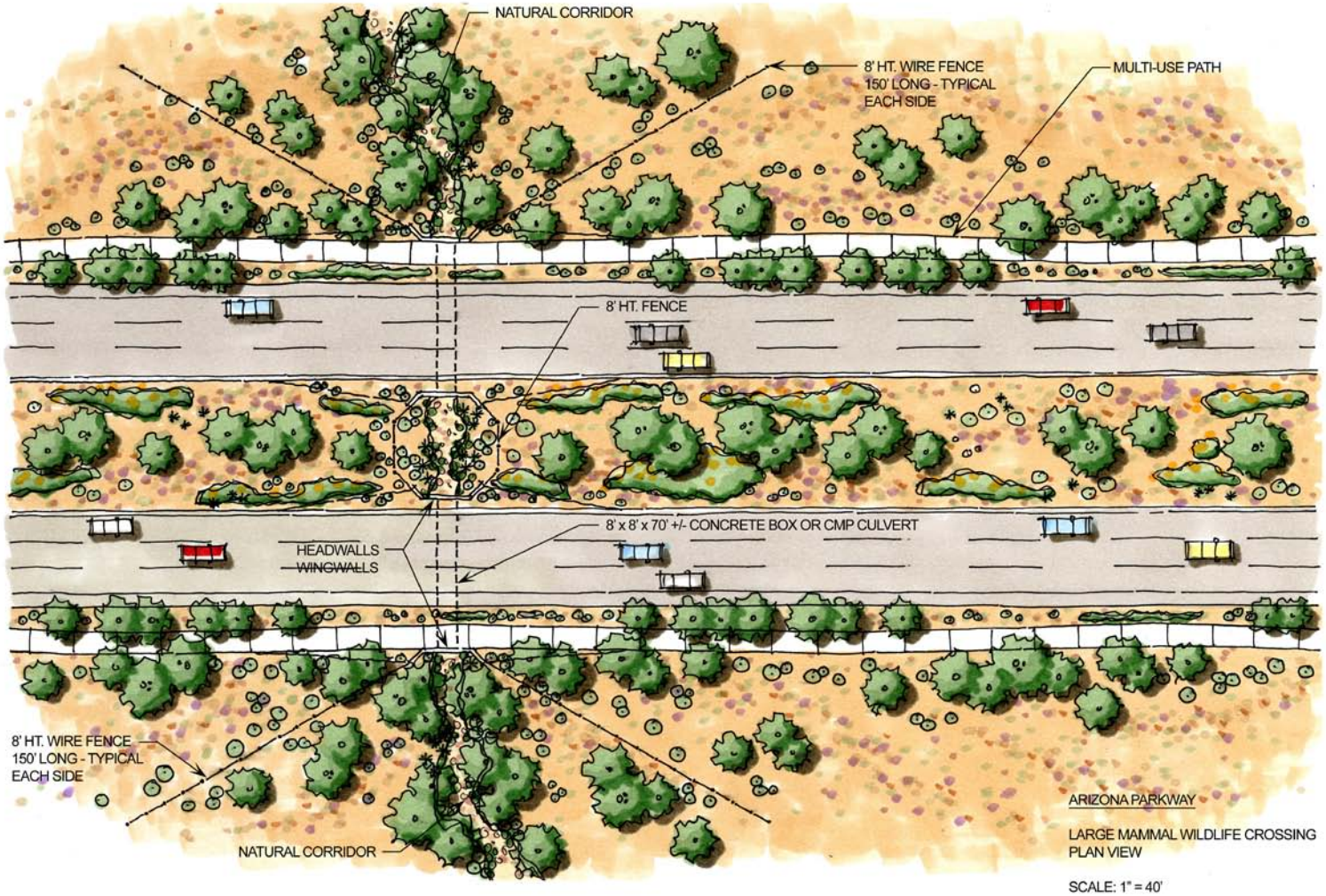
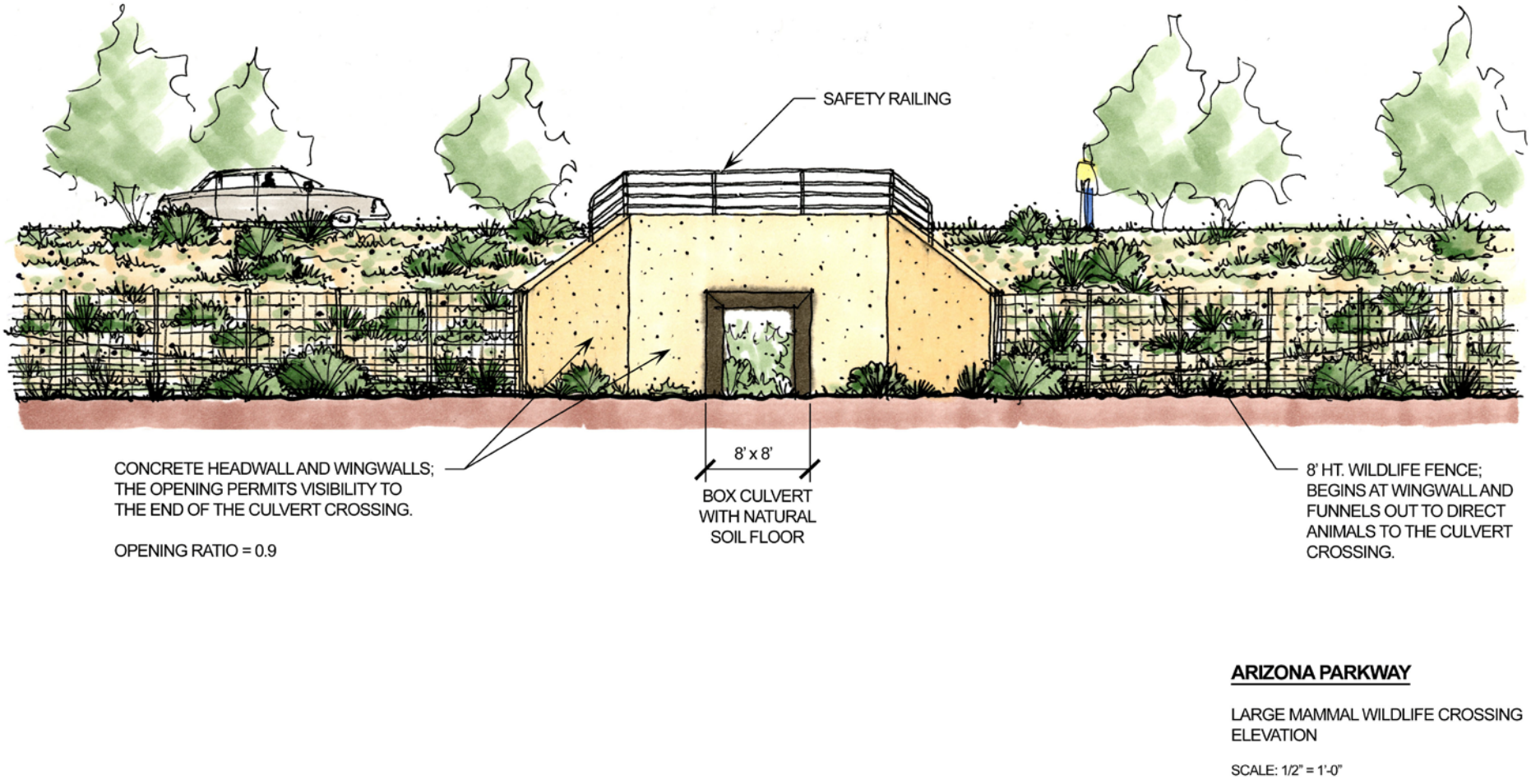


Figure 6-6 Sample Elevation – Large Mammal Wildlife Crossing, Arizona Parkway



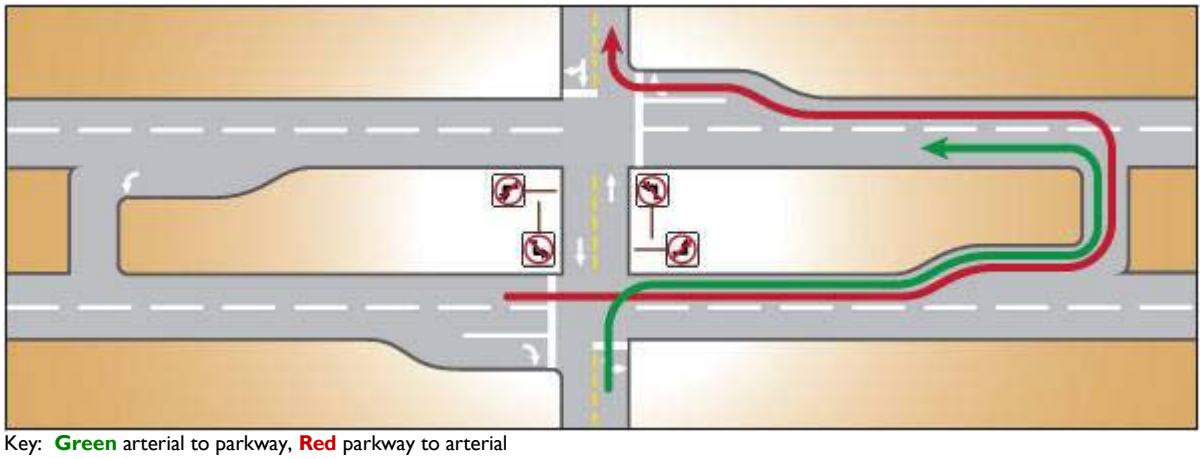
6.4.2 RSRSM and Arterial Access Control

The recommended alternative has a proposed background network of arterial streets that would accommodate shorter trips in and between Hidden Valley communities. The one-mile grid shown in Pinal County reflects the *RSRSM Plan*. The arterial network would most likely be funded by developers in cooperation with local governments.

The RSRSM access control provisions for principal arterials recommends that intersections be spaced one-quarter mile to one-half mile apart and signalized where appropriate. Full access driveways are allowed one-eighth mile from a signal. On-street parking is prohibited. Pull-outs and queue jumper lanes are allowed where warranted for transit service. Bicycle lanes and sidewalks are recommended.

Access control for parkways in Pinal County has not been prescribed in detail, but rather deferred to meet the final Arizona Parkway Guidelines, a document that the Maricopa County Department of Transportation has developed. The parkway design focuses on the provision of simple two-phase traffic signal operations at intersections by eliminating left-turn movements there and accommodating them elsewhere or by other means. This has been done extensively in Michigan and is commonly referred to as the Michigan left turn (MLT) or indirect left turn intersection design. In an MLT intersection, the left-turn movement is accommodated through a strategically placed U-turn break in the median on the far side of the main roadway. (Motorists also have the option of making several right turns.) These U-turn breaks can be signalized in particularly high-volume areas. Figure 6-7 illustrates a typical parkway-to-arterial intersection configuration.

Figure 6-7 Parkway Intersection Configuration



Key: **Green** arterial to parkway, **Red** parkway to arterial
Source: MichiganHighways.org

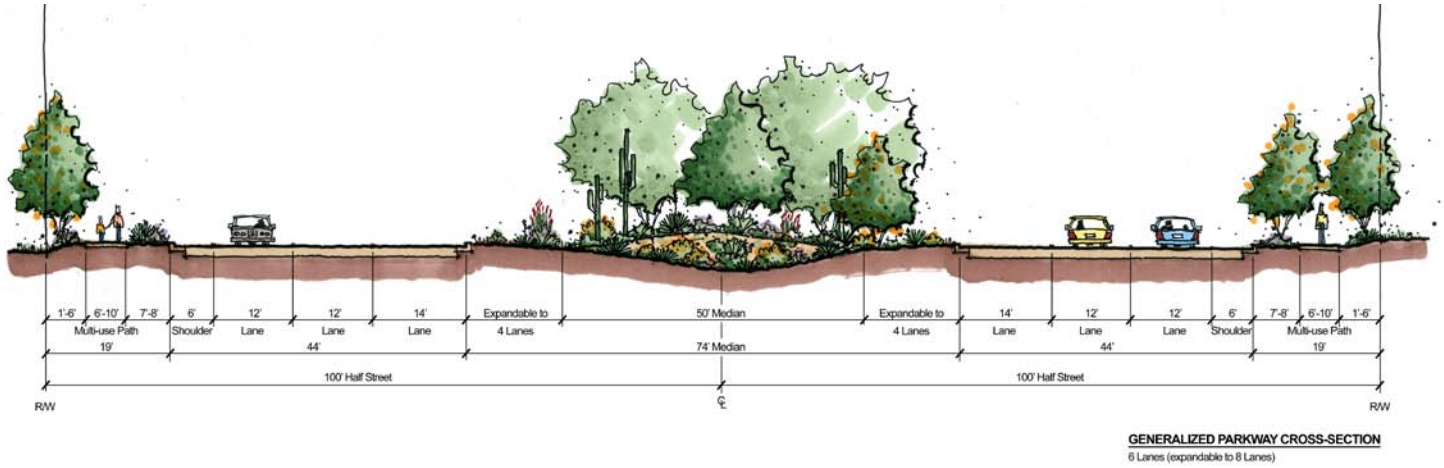
The following access management principals apply to the parkway facility:

- A divided cross-section with a 74-foot typical median.
- U-turn directional crossovers restricted to a maximum of eight per mile.
- Left turns in any direction are prohibited at all intersections (full median break).
- Left turns from a side street or driveway onto the parkway are prohibited.

- Left turns from the parkway to a side street or driveway are discouraged due to conflicts between U-turns and right turns. However, this movement can be accommodated by aligning the U-turn crossover with the side street or driveway to facilitate left turns and u-turns.
- Intersections (full median breaks) are limited to at most one per half-mile, with one-mile spacing preferred.
- No on-street parking.

Figure 6-8 illustrates a typical parkway cross-section.

Figure 6-8 Generalized Parkway Cross-Section (6 lanes)



6.4.3 Traffic Interchange Spacing and other Grade Separations

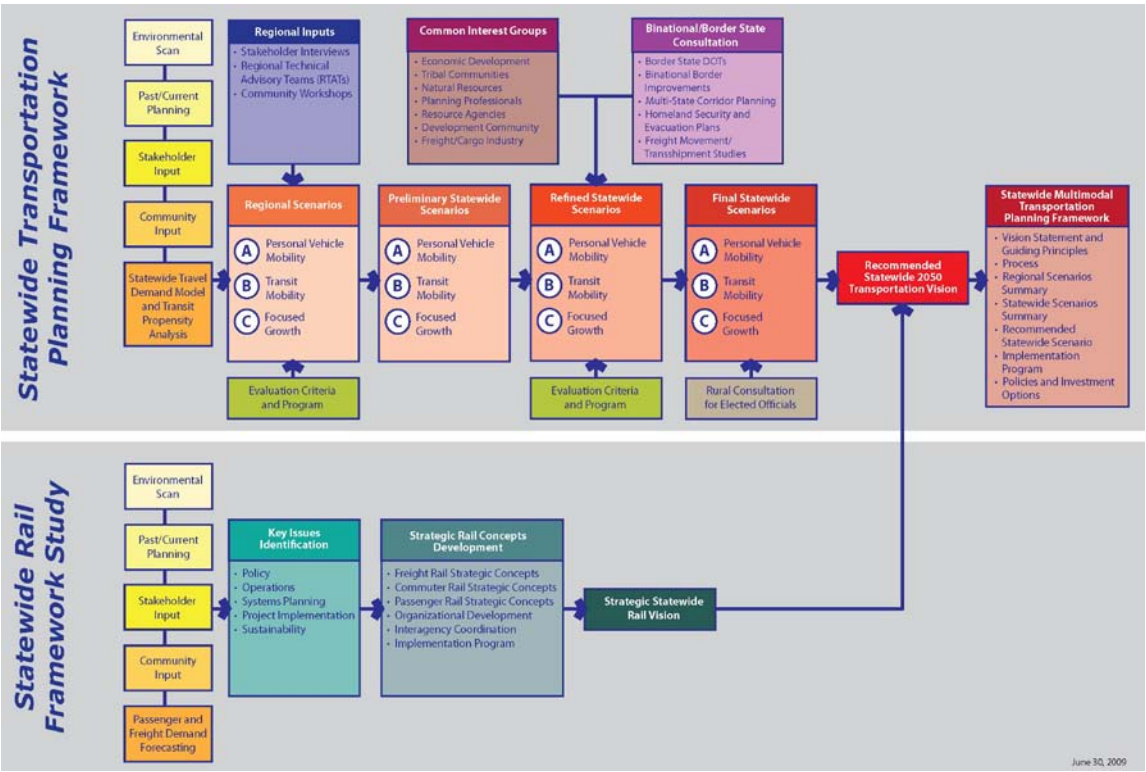
FHWA, ADOT, and MAG are working to set a minimum spacing of two miles between interchanges on Interstate highways, except where closer spacing already exists or previously received written FHWA approval. The minimum spacing from the nearest freeway-to-freeway or "system" interchange is three miles. The same spacing guidelines will be applied to non-Interstate freeways in the Hidden Valley study area where possible.

To maintain the continuity of local street systems with direct and efficient traffic flow, additional grade separations (roadway overcrossings or undercrossings) are desirable throughout urbanized portions of the study area. The recommended spacing of these crossings, which will provide no access to or from the freeway, ranges from one-half mile to one mile. Future design and traffic studies will establish their locations.

6.4.4 Relationship to other Current and Future Framework Studies

ADOT's Statewide Transportation Planning Framework program has applied the concept of a framework study statewide, with two time horizons: 2030 and 2050. For Maricopa County and a portion of Pinal, the Hidden Valley study, the I-10/Hassayampa Valley Regional Transportation Framework, and the update of the Regional Transportation Plan provide the basis for the future transportation network. In Pima County, ADOT will incorporate the update of the PAG RTP. ADOT has split the rest of the state into four regions – Northern Arizona, Western Arizona, Central Arizona, and Eastern Arizona. Through an intense stakeholder and public participation process, one or more statewide multimodal transportation networks will be proposed for the state of Arizona, including a rail development program and investment strategy. The Statewide Framework vision will set in motion transportation planning that promotes place-sensitive and environmentally responsible mobility choices, supportive of economic prosperity for sustainable communities. Figure 6-9 delineates the ADOT Statewide Framework planning process.

Figure 6-9 Statewide Transportation Planning Framework Program



6.4.5 Continuing Cut-Line Analysis for Network Planning

The recommended Hidden Valley transportation framework is fully integrated with adjacent study areas, such as the Central Arizona framework, which encompasses the rest of Pinal County. MAG and CAAG will adopt the Hidden Valley network in the form of "corridors of the future" since no funding source has been identified or secured. Future studies will further delineate alignment and access details.

As Chapter 4 explains, cut-line analysis facilitates broad assessment of the relationship of network capacity to travel demand. Total cut-line volume is obtained by adding up all the volumes on the individual roadways that cross a given cut-line. Thus, this volume represents the total two-way demand for travel over a broad portion of the network. Volume/capacity (V/C) ratios from the cut-line analyses provide a means to assess the accuracy and reasonableness of travel demand model results. They can be either a test based on traffic volumes produced by the model, as in this study, or an actual count to assist model calibration.

The principal use of cut-lines in this study was to evaluate the degree to which the cumulative traffic volumes, under either Buildout or 2030 conditions, across a given cutline exceeded the established goal of LOS D for the regional roadway network. Evaluation of the V/C ratios of the cut-lines permitted planners to adjust the recommended roadway network to provide more capacity where needed.

Implementation of recommendations for the Hidden Valley will benefit from the application of traffic counts and near-term traffic forecasts in relation to the established cut-lines. Cut-line analysis gives planners and decision-makers a tool to evaluate progress in developing the regional roadway network by assessing its performance at periodic intervals. These cut-line reviews should be conducted through active regional network performance monitoring. This effort would focus on meeting the following objectives:

- Ensure coordination between communities, as major capital improvement projects are identified for construction;
- Review roadway network performance of the planned transportation system, as defined by interim implementation planning horizons (i.e., ten-year increments);
- Produce and use ten-year travel demand forecasts, based on the existing plus committed roadway network and planned network capacity upgrades;
- Compare both segment and cut-line performance to ensure that regional mobility goals are met;
- Maintain cut-line performance, based on daily volume projections, at a V/C ratio of no greater than 0.89, i.e., LOS D or better.

Certain cut-lines are more critical than others because of their proximity to concentrations of existing and future development. The highest priority cut-lines should be emphasized as guides for monitoring network performance in the future. The following criteria were used to determine the high-priority cut-lines in the Hidden Valley study area:

- A high level of inter-community travel;
- Travel across constrained sections of the study area network (e.g., physical barriers, areas with natural limits on network connectivity);
- High travel demand across cut-lines under Buildout conditions.

Four cut-lines meet these criteria:

- C: I-10/Casa Grande/Eloy (north-south)
- D: Maricopa/Casa Grande (north-south)
- J: Gila River/Buckeye/Goodyear (east-west)
- M: Gila River Indian Community/Maricopa/Casa Grande (east-west)

6.4.6 Continuing Coordination with Tribal Communities

The study team has worked with both the GRIC and Ak-Chin Indian Community through a series of meetings and outreach events. Both communities were represented on the Study Review Team. Because the Indian

communities are sovereign entities, no roadway or transit improvements were proposed on tribal land without support from official representatives of the tribe. ***In addition, all recommended framework improvements within or across tribal land are contingent upon official concurrence from the governing council of each tribe.*** MAG staff have made a commitment to present the recommended, multimodal Hidden Valley framework to the GRIC and Ak-Chin tribal councils, in an effort to obtain resolutions of concurrence.

The GRIC is currently undertaking a Small Area Transportation Study in order to better understand current transportation conditions and plan for future improvements. MAG will continue to coordinate with the GRIC on this process as a whole, and to ensure network consistency with the Hidden Valley recommendations. MAG will also continue coordination with the Ak-Chin Indian Community as implementation of the Hidden Valley network moves forward.

APPENDIX A

YEAR 2030 SEGMENT-LEVEL ROADWAY ANALYSIS, RECOMMENDED ALTERNATIVE

I-8/I-10 HIDDEN VALLEY TRANSPORTATION FRAMEWORK STUDY

DRAFT EVALUATION RESULTS FOR FINAL MODEL RUN YEAR 2030

Corridor Specific Performance Analysis Summary - Revised/Updated Sub-Area Model

				Final Year 2030 Model Run [1]											
Roadway	Segment	From	To	Length	VMT	No. of Lanes	Facility Type	Avg Vol. [2]	High Vol.	Low Vol.	Ln. Capacity	Capacity	Avg. v/c	High v/c	Comments/Remarks
Hassayampa Fwy	1	Picacho Vista Fwy	Interstate 10												
Hassayampa Fwy	2	Interstate 10	Maricopa-Casa Grande Hwy	9.22	827,256.68	6	Fwy	89,800	112,774.28	21,268.95	25,400	152,400	0.59	0.74	
Hassayampa Fwy	3	Maricopa-Casa Grande Hwy	SR-347	10.47	648,700.05	4	Fwy	62,000	84,788.67	31,503.62	25,400	101,600	0.61	0.83	
Hassayampa Fwy	4	SR-347	SR-303S (303 Spur)	12.23	801,539.76	4	Fwy	65,600	69,011.29	52,848.93	25,400	101,600	0.65	0.68	
Hassayampa Fwy	5	SR-303S (303 Spur)	SR-303L	12.99	1,180,095.59	6	Fwy	90,800	111,911.31	59,751.30	25,400	152,400	0.60	0.73	
Hassayampa Fwy	6	SR-303L	SR-85	17.32	861,952.39	4	Fwy	49,800	62,240.52	34,730.90	25,400	101,600	0.49	0.61	
Hassayampa Fwy	7	SR-85	Southern Ave	19.44	632,659.44	6	Fwy	32,500	39,115.39	29,768.43	25,400	152,400	0.21	0.26	
Hassayampa Fwy	8	Southern Ave	Interstate 10	6.11	181,177.55	8	Fwy	29,700	36,252.47	8,084.65	25,400	203,200	0.15	0.18	
SR-85 Freeway	1	Interstate 8	Maricopa Scenic Way	1.29	37,781.00	4	Fwy	29,400	30,954.09	25,972.30	25,400	101,600	0.29	0.30	
SR-85 Freeway	2	Maricopa Scenic Way	Hassayampa Fwy	20.13	664,284.77	4	Fwy	33,000	44,162.24	27,884.97	25,400	101,600	0.32	0.43	
SR-85 Freeway	3	Hassayampa Fwy	SR-801	8.48	468,491.38	6	Fwy	55,200	56,467.86	40,509.31	25,400	152,400	0.36	0.37	
SR-85 Freeway	4	SR-801	Interstate 10	4.43	258,301.57	8	Fwy	58,400	85,127.60	40,690.84	25,400	203,200	0.29	0.42	
SR-303L (Estrella Fwy Extension)	1	Hassayampa Fwy	Cotton Lane	9.45	427,613.36	4	Fwy	45,300	54,058.97	34,416.03	25,400	101,600	0.45	0.53	
SR-303L (Estrella Fwy Extension)	2	Cotton Lane	SR-801	12.20	1,034,233.75	6	Fwy	84,800	115,907.81	49,150.65	25,400	152,400	0.56	0.76	
SR-303L (Estrella Fwy Extension)	3	SR-801	Interstate 10	4.72	435,680.73	8	Fwy	92,400	122,812.05	64,579.81	25,400	203,200	0.45	0.60	
SR-303S (303 Spur)	1	Interstate 8	Hassayampa Fwy												
Watermelon Rd	1	Paloma Rd	Citrus Valley Rd	4.89	40,098.88	2	Pkwy	8,200	11,569.07	5,902.53	15,000	30,000	0.27	0.39	
Watermelon Rd	2	Citrus Valley Rd	Gila Blvd	4.02	43,375.41	2	Pkwy	10,800	11,847.36	9,756.35	15,000	30,000	0.36	0.39	
Watermelon Rd	3	Gila Blvd	Hidden Waters Pkwy	2.81	28,639.22	2	Pkwy	10,200	11,491.68	9,565.39	15,000	30,000	0.34	0.38	
Hidden Waters Pkwy	1	Maricopa Scenic Way	Watermelon Rd	1.60	6,404.22	2	Pkwy	4,000	4,331.09	3,880.57	15,000	30,000	0.13	0.14	
Hidden Waters Pkwy	2	Watermelon Rd	Woods Rd	10.26	59,292.62	2	Pkwy	5,800	10,230.11	955.78	15,000	30,000	0.19	0.34	
Hidden Waters Pkwy	3	Woods Rd	Gillespe Dam	5.42	8,057.03	2	Pkwy	1,500	1,747.20	1,225.38	15,000	30,000	0.05	0.06	
Hidden Waters Pkwy	4	Gillespe Dam	SR-801	15.28	40,196.85	2	Pkwy	2,600	13,740.11	-	15,000	30,000	0.09	0.46	
Hidden Waters Pkwy	5	SR-801	Interstate 10	7.74	39,360.45	6	Pkwy	5,100	9,392.58	2,317.42	15,000	90,000	0.06	0.10	
Sonoran Valley-Rainbow Valley Rds	1	SR-238	Casa Blanca Rd	3.23	52,593.36	2	Pkwy	16,300	21,271.93	13,155.58	15,000	30,000	0.54	0.71	
Sonoran Valley-Rainbow Valley Rds	2	Casa Blanca Rd	Dysart Rd	2.14	30,623.10	2	Pkwy	14,300	14,513.56	14,261.50	15,000	30,000	0.48	0.48	
Sonoran Valley-Rainbow Valley Rds	3	Dysart Rd	Hassayampa Fwy	8.95	26,714.71	2	Pkwy	3,000	16,650.31	814.24	15,000	30,000	0.10	0.56	
Sonoran Valley-Rainbow Valley Rds	4	Hassayampa Fwy	Queen Creek Rd	2.37	55,457.25	6	Pkwy	23,400	28,550.39	18,784.65	15,000	90,000	0.26	0.32	
Sonoran Valley-Rainbow Valley Rds	5	Queen Creek Rd	SR-303L	6.13	167,274.62	6	Pkwy	27,300	41,028.92	16,585.51	15,000	90,000	0.30	0.46	
Vekol Valley Pkwy	1	Interstate 8	Peters Rd	3.17	1,643.27	2	Pkwy	500	664.30	311.61	15,000	30,000	0.02	0.02	
Vekol Valley Pkwy	2	Peters Rd	Barnes Rd	6.24	15,981.90	2	Pkwy	2,600	4,558.86	499.38	15,000	30,000	0.09	0.15	
Vekol Valley Pkwy	3	Barnes Rd	Hassayampa Fwy	6.72	57,338.02	2	Pkwy	8,500	21,531.86	2,751.71	15,000	30,000	0.28	0.72	
Vekol Valley Pkwy	4	Hassayampa Fwy	SR-238	2.04	26,931.13	2	Pkwy	13,200	14,492.35	12,743.33	15,000	30,000	0.44	0.48	
Vekol Valley Pkwy	5	SR-238	Hassayampa Fwy	4.96	69,760.55	2	Pkwy	14,100	25,813.76	9,085.86	15,000	30,000	0.47	0.86	
Countyline Pkwy	1	Hassayampa Fwy	SR-238	4.15	17,981.94	2	Pkwy	4,300	5,448.04	2,275.83	15,000	30,000	0.14	0.18	
Warren Rd-Ralston Rd	1	Selma Hwy	Barnes Rd	2.51	47,668.52	4	Pkwy	19,000	21,030.58	18,365.32	15,000	60,000	0.32	0.35	
Warren Rd-Ralston Rd	2	Barnes Rd	Hassayampa Fwy	2.28	56,749.92	4	Pkwy	24,900	28,158.36	23,627.94	15,000	60,000	0.42	0.47	
Warren Rd-Ralston Rd	3	Hassyampa Fwy	SR-238	9.31	486,397.56	6	Pkwy	52,200	63,488.55	30,509.25	15,000	90,000	0.58	0.71	
SR-347	1	Interstate 8	SR-84	2.89	39,942.54	4	Pkwy	13,800	16,949.09	9,653.56	15,000	60,000	0.23	0.28	
SR-347	2	SR-84	Barnes Rd	2.77	41,280.95	4	Pkwy	14,900	25,439.75	7,266.82	15,000	60,000	0.25	0.42	
SR-347	3	Barnes Rd	Hassayampa Fwy	0.46	7,531.43	2	Pkwy	16,400	16,484.23	16,484.23	15,000	30,000	0.55	0.55	
SR-347	4	Hassayampa Fwy	Val Vista Rd	2.70	69,318.50	2	Pkwy	25,700	40,507.17	15,367.72	15,000	30,000	0.86	**1.35**	
SR-347	5	Val Vista Rd	Farrell Rd	4.61	269,710.39	6	Pkwy	58,500	68,438.86	50,924.78	15,000	90,000	0.65	0.76	
SR-347	6	Farrell Rd	Maricopa-Casa Grande Hwy	1.96	81,332.07	6	Major Arterial	41,500	42,495.72	36,977.59	10,900	65,400	0.63	0.65	
SR-347	7	Maricopa-Casa Grande Hwy	SR-238	1.03	35,060.79	6	Major Arterial	34,000	33,978.76	33,683.99	10,900	65,400	0.52	0.52	
SR-347	8	SR-238	Hiller Rd	1.18	55,610.11	6	Pkwy	47,100	49,108.96	40,943.83	15,000	90,000	0.52	0.55	
SR-347	9	Hiller Rd	Riggs Rd	9.57	757,708.10	6	Pkwy	79,200	83,943.98	77,072.05	15,000	90,000	0.88	**0.93**	

I-8/I-10 HIDDEN VALLEY TRANSPORTATION FRAMEWORK STUDY

DRAFT EVALUATION RESULTS FOR FINAL MODEL RUN **YEAR 2030**

Corridor Specific Performance Analysis Summary - Revised/Updated Sub-Area Model

				Final Year 2030 Model Run [1]											
Roadway	Segment	From	To	Length	VMT	No. of Lanes	Facility Type	Avg Vol. [2]	High Vol.	Low Vol.	Ln. Capacity	Capacity	Avg. v/c	High v/c	Comments/Remarks
Murphy-Smith Enke Loop	1	Maricopa-Casa Grande Hwy	Honeycut Rd	3.54	46,671.04	4	Major Arterial	13,200	23,748.37	1,727.09	10,900	43,600	0.30	0.54	
Murphy-Smith Enke Loop	2	Honeycut Rd	SR-238/SR-347	6.89	83,553.57	4	Major Arterial	12,100	21,811.19	9,371.28	10,900	43,600	0.28	0.50	
Anderson Rd	1	Interstate 8	SR-84	3.55	135,241.30	6	Pkwy	38,100	41,355.34	27,892.87	15,000	90,000	0.42	0.46	
Anderson Rd	2	SR-84	Kortsen Rd	1.97	79,174.30	6	Pkwy	40,200	44,479.50	38,401.57	15,000	90,000	0.45	0.49	
Anderson Rd	3	Kortsen Rd	Hassayampa Fwy	1.05	51,733.16	6	Pkwy	49,300	52,632.91	41,085.98	15,000	90,000	0.55	0.58	
Anderson Rd	4	Hassayampa Fwy	Maricopa-Casa Grande Hwy	5.73	147,774.95	6	Pkwy	25,800	62,476.17	10,223.96	15,000	90,000	0.29	0.69	
Kortsen Rd	1	Vekol Valley Pkwy	SR-303S (303 Spur)												
Kortsen Rd	2	SR-303S (303 Spur)	Warren Rd												
Kortsen Rd	3	Warren Rd	SR-347	3.94	34,255.79	2	Major Arterial	8,700	13,722.02	4,714.59	10,900	21,800	0.40	0.63	
Kortsen Rd	4	SR-347	Anderson Rd	7.00	186,751.29	6	Major Arterial	26,700	33,796.00	15,840.49	10,900	65,400	0.41	0.52	
Kortsen Rd	5	Anderson Rd	Montgomery Rd	4.36	64,940.17	6	Major Arterial	14,900	21,184.72	8,657.84	10,900	65,400	0.23	0.32	
Kortsen Rd	6	Montgomery Rd	Pinal Ave (SR-387)	5.72	128,168.32	6	Major Arterial	22,400	28,579.52	13,997.11	10,900	65,400	0.34	0.44	
Kortsen Rd	7	Pinal Ave (SR-387)	Interstate 10	3.93	107,537.81	4	Major Arterial	27,400	42,380.41	21,378.11	10,900	43,600	0.63	**0.97**	
SR-238	1	Sonoran Valley Pkwy	Hassayampa Fwy	1.19	21,133.87	2	Pkwy	17,800	18,884.10	5,556.18	15,000	30,000	0.59	0.63	
SR-238	2	Hassayampa Fwy	Vekol Valley Pkwy	2.51	47,703.20	4	Fwy	19,000	22,412.56	16,856.38	25,400	101,600	0.19	0.22	
SR-238	3	Vekol Valley Pkwy	Countyline Pkwy	2.10	66,218.04	4	Fwy	31,500	31,573.10	31,266.88	25,400	101,600	0.31	0.31	
SR-238	4	Countyline Pkwy	Warren Rd	3.95	145,957.68	4	Fwy	37,000	47,392.67	34,056.57	25,400	101,600	0.36	0.47	
SR-238	5	Warren Rd	SR-347	5.38	324,441.70	4	Fwy	60,300	95,278.35	14,152.70	25,400	101,600	0.59	**0.94**	
Maricopa-Casa Grande Highway	6	SR-347	White and Parker Rd	4.35	181,309.28	6	Pkwy	41,700	56,201.83	18,335.74	15,000	90,000	0.46	0.62	
Maricopa-Casa Grande Highway	7	White and Parker Rd	Anderson Rd	4.58	271,325.20	6	Pkwy	59,200	77,714.12	50,481.37	15,000	90,000	0.66	0.86	
Maricopa-Casa Grande Highway	8	Anderson Rd	Hassayampa Fwy	2.79	84,650.69	6	Major Arterial	30,300	38,542.79	18,515.32	10,900	65,400	0.46	0.59	
Florence Blvd/SR-84/SR-287	1	Interstate 8	SR-347	5.77	22,770.57	2	Major Arterial	3,900	6,290.15	1,826.79	10,900	21,800	0.18	0.29	
Florence Blvd/SR-84/SR-287	2	SR-347	Montgomery Rd	11.01	254,297.02	4	Pkwy	23,100	30,872.99	7,593.61	15,000	60,000	0.39	0.51	
Florence Blvd/SR-84/SR-287	3	Montgomery Rd	Pinal Ave (SR-387)	6.01	193,574.01	6	Pkwy	32,200	38,725.35	26,051.02	15,000	90,000	0.36	0.43	
Florence Blvd/SR-84/SR-287	4	Pinal Ave (SR-387)	Interstate 10	4.00	191,507.78	6	Major Arterial	47,900	68,240.55	27,531.76	10,900	65,400	0.73	**1.04**	
Montgomery Rd	1	Interstate 8	Kortsen Rd	5.32	232,843.41	4	Fwy	43,800	49,920.85	33,210.38	25,400	101,600	0.43	0.49	
Montgomery Rd	2	Kortsen Rd	Hassayampa Fwy	3.60	139,480.60	4	Fwy	38,800	40,478.15	30,511.99	25,400	101,600	0.38	0.40	
Hombre de Agua	1	Cotton Lane	Sonoran Valley Pkwy	15.51	180,502.94	4	Major Arterial	11,600	20,948.31	2,790.03	10,900	43,600	0.27	0.48	
Interstate 8	1	Paloma Rd	SR-85	11.57	478,287.78	4	Fwy	41,400	56,466.15	25,547.58	25,400	101,600	0.41	0.56	
Interstate 8	2	SR-85	SR-303 Spur	28.35	752,917.46	4	Fwy	26,600	26,694.43	23,026.53	25,400	101,600	0.26	0.26	
Interstate 8	3	SR-303 Spur	SR-347	10.70	271,837.46	6	Fwy	25,400	26,407.98	23,615.13	25,400	152,400	0.17	0.17	
Interstate 8	4	SR-347	Anderson Rd	6.97	326,655.42	6	Fwy	46,900	51,455.72	39,802.44	25,400	152,400	0.31	0.34	
Interstate 8	5	Anderson Rd	Montgomery Rd	4.07	260,599.75	6	Fwy	64,100	65,778.03	57,013.22	25,400	152,400	0.42	0.43	
Interstate 8	6	Montgomery Rd	Trekell Rd	6.98	654,978.51	6	Fwy	93,900	101,191.61	89,197.54	25,400	152,400	0.62	0.66	
Interstate 8	7	Trekell Rd	Interstate 10	2.95	328,225.75	6	Fwy	111,300	110,157.25	110,157.25	25,400	152,400	0.73	0.72	
Interstate 10	1	Riggs Rd	Casa Blanca Rd	8.61	1,393,415.80	6	Fwy	161,900	168,263.78	146,451.57	25,400	152,400	**1.06**	**1.10**	
Interstate 10	2	Casa Blanca Rd	SR-387/Pinal Ave	9.21	1,612,793.30	6	Fwy	175,200	179,347.83	166,324.31	25,400	152,400	**1.15**	**1.18**	
Interstate 10	3	SR-387/Pinal Ave	Hassayampa Fwy	2.64	378,506.31	6	Fwy	143,400	144,190.73	140,020.78	25,400	152,400	**0.94**	**0.95**	
Interstate 10	4	Hassayampa Fwy	Kortsen Rd	4.86	671,081.53	6	Fwy	138,200	154,233.92	105,099.60	25,400	152,400	**0.91**	**1.01**	
Interstate 10	5	Kortsen Rd	Selma Hwy	4.11	546,721.84	6	Fwy	133,000	142,550.16	117,392.52	25,400	152,400	0.87	**0.94**	
Interstate 10	6	Selma Hwy	Interstate 8	2.15	245,376.38	6	Fwy	114,400	122,604.64	103,537.28	25,400	152,400	0.75	0.80	
Interstate 10	7	Interstate 8	Toltec Rd	5.31	1,006,303.41	6	Fwy	189,500	213,050.92	104,259.91	25,400	152,400	**1.24**	**1.40**	

Prepared by: Wilson & Company, 06/21/09

Notes:

1. MAG Year 2030 Final Travel Demand Model Run, dated: 06/19/09.
2. Average Volume on a Segment is Calculated by Dividing Total VMT by the Length of Segment.
3. Shading Indicates Buildout Daily Volume Estimates for Segments of Hiddenwaters Parkway within the I-10/Hassayampa Valley Transportation Framework Study Area based on Hassayampa Valley Build Out Volumes on Framework Network (both Hidden and Hassayampa F/W), dated: 9/30/08
4. Red Highlighting Indicates Segment Volume-to-Capacity (v/c) Ratio Equal to or Exceeding 0.90

APPENDIX B

SEGMENT-LEVEL ROADWAY ANALYSIS AT BUILDOUT, RECOMMENDED ALTERNATIVE

I-8/I-10 HIDDEN VALLEY TRANSPORTATION FRAMEWORK STUDY

DRAFT EVALUATION RESULTS FOR FINAL MODEL RUN BUILDOUT

Corridor Specific Performance Analysis Summary - Revised/Updated Sub-Area Model

				Final Buildout Model Run [1]											
Roadway	**Segment**	**From**	**To**	**Length _No Build (Miles)**	**VMT**	**No. of Lanes**	**Facility Type**	**Avg Vol. [2]**	**High Vol.**	**Low Vol.**	**Ln. Capacity**	**Capacity**	**Avg. v/c**	**High v/c**	**Comments/Remarks**
Hassayampa Fwy	1	Picacho Vista Fwy	Interstate 10	16.4850	1864161.0095	6	Fwy	113,100	165,463	103,701	25,400	152,400	0.74	1.09	
Hassayampa Fwy	2	Interstate 10	Maricopa-Casa Grande Hwy	9.5250	2263833.6927	10	Fwy	237,700	291,191	121,623	25,400	254,000	0.94	1.15	
Hassayampa Fwy	3	Maricopa-Casa Grande Hwy	SR-347	10.4700	2141258.9007	8	Fwy	204,500	244,831	192,884	25,400	203,200	1.01	1.20	
Hassayampa Fwy	4	SR-347	SR-303S (303 Spur)	12.2250	2533571.0118	8	Fwy	207,200	235,379	155,614	25,400	203,200	1.02	1.16	
Hassayampa Fwy	5	SR-303S (303 Spur)	SR-303L	12.9900	3566757.1568	10	Fwy	274,600	320,029	154,902	25,400	254,000	1.08	1.26	
Hassayampa Fwy	6	SR-303L	SR-85	17.3200	2597766.5804	6	Fwy	150,000	166,246	118,357	25,400	152,400	0.98	1.09	
Hassayampa Fwy	7	SR-85	Southern Ave	19.4400	2099334.0499	6	Fwy	108,000	150,800	90,005	25,400	152,400	0.71	0.99	
Hassayampa Fwy	8	Southern Ave	Interstate 10	6.1050	466008.6545	8	Fwy	76,300	94,427	31,799	25,400	203,200	0.38	0.46	
SR-85 Freeway	1	Interstate 8	Maricopa Scenic Way	1.8300	200598.6699	4	Fwy	109,600	153,197	34,049	25,400	101,600	1.08	1.51	
SR-85 Freeway	2	Maricopa Scenic Way	Hassayampa Fwy	20.1250	2947905.4350	4	Fwy	146,500	166,297	123,764	25,400	101,600	1.44	1.64	
SR-85 Freeway	3	Hassayampa Fwy	SR-801	8.4800	1380013.5216	6	Fwy	162,700	166,397	107,721	25,400	152,400	1.07	1.09	
SR-85 Freeway	4	SR-801	Interstate 10	4.4250	447616.0441	8	Fwy	101,200	125,639	90,085	25,400	203,200	0.50	0.62	
SR-303L (Estrella Fwy Extension)	1	Hassayampa Fwy	Cotton Lane	9.4500	1353925.4647	8	Fwy	143,300	164,097	123,045	25,400	203,200	0.71	0.81	
SR-303L (Estrella Fwy Extension)	2	Cotton Lane	SR-801	12.1950	2646253.4263	8	Fwy	217,000	290,405	153,796	25,400	203,200	1.07	1.43	
SR-303L (Estrella Fwy Extension)	3	SR-801	Interstate 10	4.7150	777995.8323	8	Fwy	165,000	204,316	95,309	25,400	203,200	0.81	1.01	
SR-303S (303 Spur)	1	Interstate 8	Hassayampa Fwy	11.6600	1046289.2367	4	Fwy	89,700	100,863	55,289	25,400	101,600	0.88	0.99	
Watermelon Rd	1	Paloma Rd	Citrus Valley Rd	4.8900	418614.2529	4	Pkwy	85,600	123,313	51,945	15,000	60,000	1.43	2.06	
Watermelon Rd	2	Citrus Valley Rd	Gila Blvd	4.0200	507385.8769	4	Pkwy	126,200	135,887	115,884	15,000	60,000	2.10	2.26	
Watermelon Rd	3	Gila Blvd	Hidden Waters Pkwy	2.8100	301130.6024	4	Pkwy	107,200	132,653	95,253	15,000	60,000	1.79	2.21	
Hidden Waters Pkwy	1	Maricopa Scenic Way	Watermelon Rd	1.6000	45985.1595	2	Pkwy	28,700	29,544	26,196	15,000	30,000	0.96	0.98	
Hidden Waters Pkwy	2	Watermelon Rd	Woods Rd	10.2600	534980.1493	4	Pkwy	52,100	79,776	26,633	15,000	60,000	0.87	1.33	
Hidden Waters Pkwy	3	Woods Rd	Gillespe Dam	5.4200	212451.3194	4	Pkwy	39,200	39,656	38,800	15,000	60,000	0.65	0.66	
Hidden Waters Pkwy	4	Gillespe Dam	SR-801	15.2800	474256.8048	4	Pkwy	31,000	40,928	21,732	15,000	60,000	0.52	0.68	
Hidden Waters Pkwy	5	SR-801	Interstate 10	7.7400	85644.2002	6	Pkwy	11,100	14,825	6,706	15,000	90,000	0.12	0.16	
Sonoran Valley-Rainbow Valley Rds	1	SR-238	Casa Blanca Rd	3.2300	210439.0709	6	Pkwy	65,200	71,297	56,849	15,000	90,000	0.72	0.79	
Sonoran Valley-Rainbow Valley Rds	2	Casa Blanca Rd	Dysart Rd	2.1400	151616.0227	8	Pkwy	70,800	72,493	67,046	15,000	120,000	0.59	0.60	
Sonoran Valley-Rainbow Valley Rds	3	Dysart Rd	Hassayampa Fwy	8.9500	279138.5355	6	Pkwy	31,200	53,837	8,993	15,000	90,000	0.35	0.60	
Sonoran Valley-Rainbow Valley Rds	4	Hassayampa Fwy	Queen Creek Rd	2.3700	99934.0027	6	Pkwy	42,200	52,679	34,362	15,000	90,000	0.47	0.59	
Sonoran Valley-Rainbow Valley Rds	5	Queen Creek Rd	SR-303L	6.1300	281983.0203	6	Pkwy	46,000	76,394	35,458	15,000	90,000	0.51	0.85	
Vekol Valley Pkwy	1	Interstate 8	Peters Rd	3.1700	52530.1810	6	Pkwy	16,600	22,065	3,190	15,000	90,000	0.18	0.25	
Vekol Valley Pkwy	2	Peters Rd	Barnes Rd	6.2400	251381.9415	6	Pkwy	40,300	52,733	22,103	15,000	90,000	0.45	0.59	
Vekol Valley Pkwy	3	Barnes Rd	Hassayampa Fwy	6.7200	365396.6885	6	Pkwy	54,400	74,978	49,593	15,000	90,000	0.60	0.83	
Vekol Valley Pkwy	4	Hassayampa Fwy	SR-238	2.0400	177092.3638	6	Pkwy	86,800	105,132	73,748	15,000	90,000	0.96	1.17	
Vekol Valley Pkwy	5	SR-238	Hassayampa Fwy	4.9600	256483.3554	6	Pkwy	51,700	75,355	37,897	15,000	90,000	0.57	0.84	
Countyline Pkwy	1	Hassayampa Fwy	SR-238	4.7100	228843.8946	6	Pkwy	48,600	80,400	22,740	15,000	90,000	0.54	0.89	
Warren Rd-Ralston Rd	1	Selma Hwy	Barnes Rd	2.5100	114437.3746	6	Pkwy	45,600	72,233	37,007	15,000	90,000	0.51	0.80	
Warren Rd-Ralston Rd	2	Barnes Rd	Hassayampa Fwy	2.2800	125256.6475	6	Pkwy	54,900	75,942	46,819	15,000	90,000	0.61	0.84	
Warren Rd-Ralston Rd	3	Hassyampa Fwy	SR-238	9.3100	637387.5388	6	Pkwy	68,500	100,777	43,603	15,000	90,000	0.76	1.12	
SR-347	1	Interstate 8	SR-84	2.8900	131369.3576	8	Pkwy	45,500	50,201	42,307	15,000	120,000	0.38	0.42	
SR-347	2	SR-84	Barnes Rd	2.7700	219543.3983	8	Pkwy	79,300	101,308	61,270	15,000	120,000	0.66	0.84	
SR-347	3	Barnes Rd	Hassayampa Fwy	0.4600	37617.3752	8	Pkwy	81,800	82,334	82,334	15,000	120,000	0.68	0.69	
SR-347	4	Hassayampa Fwy	Val Vista Rd	2.7000	211387.6284	8	Pkwy	78,300	93,658	70,914	15,000	120,000	0.65	0.78	
SR-347	5	Val Vista Rd	Farrell Rd	4.6100	332202.8618	6	Pkwy	72,100	87,831	48,317	15,000	90,000	0.80	0.98	
SR-347	6	Farrell Rd	Maricopa-Casa Grande Hwy	1.9600	91768.5134	6	Major Arterial	46,800	56,910	37,826	10,900	65,400	0.72	0.87	
SR-347	7	Maricopa-Casa Grande Hwy	SR-238	1.0300	59449.6982	6	Pkwy	57,700	57,856	50,952	15,000	90,000	0.64	0.64	
SR-347	8	SR-238	Hiller Rd	1.1800	97067.4006	8	Pkwy	82,300	88,476	62,938	15,000	120,000	0.69	0.74	
SR-347	9	Hiller Rd	Riggs Rd	9.5700	1209158.6878	6	Pkwy	126,300	135,748	120,698	15,000	90,000	1.40	1.51	

I-8/I-10 HIDDEN VALLEY TRANSPORTATION FRAMEWORK STUDY

DRAFT EVALUATION RESULTS FOR FINAL MODEL RUN BUILDOUT

Corridor Specific Performance Analysis Summary - Revised/Updated Sub-Area Model

				Final Buildout Model Run [1]											
Roadway	**Segment**	**From**	**To**	**Length _No Build (Miles)**	**VMT**	**No. of Lanes**	**Facility Type**	**Avg Vol. [2]**	**High Vol.**	**Low Vol.**	**Ln. Capacity**	**Capacity**	**Avg. v/c**	**High v/c**	**Comments/Remarks**
Murphy-Smith Enke Loop	1	Maricopa-Casa Grande Hwy	Honeycut Rd	3.5400	85475.5097	4	Major Arterial	24,100	38,465	5,792	10,900	43,600	0.55	0.88	
Murphy-Smith Enke Loop	2	Honeycut Rd	SR-238/SR-347	6.8900	210507.8371	4	Major Arterial	30,600	46,862	17,593	10,900	43,600	0.70	**1.07**	
Anderson Rd	1	Interstate 8	SR-84	3.5500	187526.5406	8	Pkwy	52,800	59,982	48,241	15,000	120,000	0.44	0.50	
Anderson Rd	2	SR-84	Kortsen Rd	1.9700	146938.5938	8	Pkwy	74,600	84,056	70,620	15,000	120,000	0.62	0.70	
Anderson Rd	3	Kortsen Rd	Hassayampa Fwy	1.0500	99091.0757	8	Pkwy	94,400	104,574	85,705	15,000	120,000	0.79	0.87	
Anderson Rd	4	Hassayampa Fwy	Maricopa-Casa Grande Hwy	5.7300	346988.6277	8	Pkwy	60,600	113,453	27,609	15,000	120,000	0.51	**0.95**	
Kortsen Rd	1	Vekol Valley Pkwy	SR-303S (303 Spur)	0.3500	15570.0241	6	Pkwy	44,500	44,992	43,980	15,000	90,000	0.49	0.50	
Kortsen Rd	2	SR-303S (303 Spur)	Warren Rd	7.5500	235113.4049	6	Pkwy	31,100	58,387	9,384	15,000	90,000	0.35	0.65	
Kortsen Rd	3	Warren Rd	SR-347	3.9400	118831.7705	4	Major Arterial	30,200	38,454	23,470	10,900	43,600	0.69	0.88	
Kortsen Rd	4	SR-347	Anderson Rd	7.0000	292852.7733	6	Major Arterial	41,800	62,061	23,222	10,900	65,400	0.64	**0.95**	
Kortsen Rd	5	Anderson Rd	Montgomery Rd	4.3600	169725.6402	6	Major Arterial	38,900	48,223	27,700	10,900	65,400	0.59	0.74	
Kortsen Rd	6	Montgomery Rd	Pinal Ave (SR-387)	5.7200	222172.5142	6	Major Arterial	38,800	57,130	23,236	10,900	65,400	0.59	0.87	
Kortsen Rd	7	Pinal Ave (SR-387)	Interstate 10	3.9300	131730.6197	4	Major Arterial	33,500	52,595	24,443	10,900	43,600	0.77	**1.21**	
SR-238	1	Sonoran Valley Pkwy	Hassayampa Fwy	1.1900	66457.6372	6	Pkwy	55,800	61,090	31,246	15,000	90,000	0.62	0.68	
SR-238	2	Hassayampa Fwy	Vekol Valley Pkwy	2.2650	207712.3863	6	Fwy	91,700	109,429	31,246	25,400	152,400	0.60	0.72	
SR-238	3	Vekol Valley Pkwy	Countyline Pkwy	2.1000	250394.4949	6	Fwy	119,200	121,409	112,663	25,400	152,400	0.78	0.80	
SR-238	4	Countyline Pkwy	Warren Rd	3.9450	583660.9183	6	Fwy	147,900	172,499	140,757	25,400	152,400	**0.97**	**1.13**	
SR-238	5	Warren Rd	SR-347	5.3800	757150.3802	8	Fwy	140,700	221,804	41,542	25,400	203,200	0.69	**1.09**	
Maricopa-Casa Grande Highway	6	SR-347	White and Parker Rd	4.2400	216336.7346	6	Pkwy	51,000	64,242	25,578	15,000	90,000	0.57	0.71	
Maricopa-Casa Grande Highway	7	White and Parker Rd	Anderson Rd	4.5800	421736.6555	8	Pkwy	92,100	103,721	80,714	15,000	120,000	0.77	0.86	
Maricopa-Casa Grande Highway	8	Anderson Rd	Hassayampa Fwy	2.7900	126240.4543	6	Major Arterial	45,200	56,118	27,226	10,900	65,400	0.69	0.86	
Florence Blvd/SR-84/SR-287	1	Interstate 8	SR-347	5.7700	223802.8960	6	Major Arterial	38,800	48,238	29,525	10,900	65,400	0.59	0.74	
Florence Blvd/SR-84/SR-287	2	SR-347	Montgomery Rd	11.0100	661918.9123	8	Pkwy	60,100	82,745	14,894	15,000	120,000	0.50	0.69	
Florence Blvd/SR-84/SR-287	3	Montgomery Rd	Pinal Ave (SR-387)	6.0100	439236.9689	8	Pkwy	73,100	99,563	50,913	15,000	120,000	0.61	0.83	
Florence Blvd/SR-84/SR-287	4	Pinal Ave (SR-387)	Interstate 10	4.0000	266679.1533	6	Major Arterial	66,700	97,148	42,261	10,900	65,400	**1.02**	**1.49**	
Montgomery Rd	1	Interstate 8	Kortsen Rd	5.3200	764154.2188	6	Fwy	143,600	148,581	115,877	25,400	152,400	**0.94**	**0.97**	
Montgomery Rd	2	Kortsen Rd	Hassayampa Fwy	3.5950	483046.7010	6	Fwy	134,400	144,608	106,932	25,400	152,400	0.88	**0.95**	
Hombre de Agua	1	Cotton Lane	Sonoran Valley Pkwy	15.5100	255176.7597	4	Major Arterial	16,500	38,455	7,464	10,900	43,600	0.38	0.88	
Interstate 8	1	Paloma Rd	SR-85	11.5650	1916045.6613	4	Fwy	165,700	197,586	70,472	25,400	101,600	**1.63**	**1.94**	
Interstate 8	2	SR-85	SR-303 Spur	28.3500	3390494.9444	4	Fwy	119,600	145,764	90,307	25,400	101,600	**1.18**	**1.43**	
Interstate 8	3	SR-303 Spur	SR-347	10.6950	1410951.5756	6	Fwy	131,900	143,590	115,945	25,400	152,400	0.87	**0.94**	
Interstate 8	4	SR-347	Anderson Rd	6.9650	1154328.4231	6	Fwy	165,700	174,000	143,098	25,400	152,400	**1.09**	**1.14**	
Interstate 8	5	Anderson Rd	Montgomery Rd	4.0650	551368.1673	6	Fwy	135,600	160,656	126,093	25,400	152,400	0.89	**1.05**	
Interstate 8	6	Montgomery Rd	Trekell Rd	6.9750	1191231.9070	6	Fwy	170,800	192,534	160,260	25,400	152,400	**1.12**	**1.26**	
Interstate 8	7	Trekell Rd	Interstate 10	2.9500	635239.7628	6	Fwy	215,300	214,627	214,627	25,400	152,400	**1.41**	**1.41**	
Interstate 10	1	Riggs Rd	Casa Blanca Rd	8.6050	2391987.0197	8	Fwy	278,000	294,379	244,395	25,400	203,200	**1.37**	**1.45**	
Interstate 10	2	Casa Blanca Rd	SR-387/Pinal Ave	9.2050	2664933.7626	8	Fwy	289,500	298,739	283,292	25,400	203,200	**1.42**	**1.47**	
Interstate 10	3	SR-387/Pinal Ave	Hassayampa Fwy	2.6400	683771.2491	10	Fwy	259,000	262,867	243,844	25,400	254,000	**1.02**	**1.03**	
Interstate 10	4	Hassayampa Fwy	Kortsen Rd	4.8550	523400.7205	8	Fwy	107,800	165,522	84,977	25,400	203,200	0.53	0.81	
Interstate 10	5	Kortsen Rd	Selma Hwy	4.1100	457690.7851	8	Fwy	111,400	124,989	92,998	25,400	203,200	0.55	0.62	
Interstate 10	6	Selma Hwy	Interstate 8	2.1450	231704.9192	8	Fwy	108,000	122,353	89,922	25,400	203,200	0.53	0.60	
Interstate 10	7	Interstate 8	Toltec Rd	5.3100	1173758.7201	8	Fwy	221,000	261,407	74,267	25,400	203,200	**1.09**	**1.29**	

Prepared by: Wilson & Company, 04/30/09

Notes:

1. MAG Buildout Final Travel Demand Model Run, dated: 04/25/09.
2. Average Volume on a Segment is Calculated by Dividing Total VMT by the Length of Segment.
3. Shading Indicates Buildout Daily Volume Estimates for Segments of Hiddenwaters Parkway within the I-10/Hassayampa Valley Transportation Framework Study Area based on Hassayampa Valley Build Out Volumes on Framework Network (both Hidden and Hassayampa F/W), dated: 9/30/08
4. Red Highlighting Indicates Segment Volume-to-Capacity (v/c) Ratio Equal to or Exceeding 0.90

Chapter 7

Transportation Funding Options

August 2009

Prepared for

MARICOPA ASSOCIATION of GOVERNMENTS

Prepared by

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Curtis Lueck & Associates

In Association With

AECOM

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7.1 Introduction

This chapter analyzes transportation revenue available to jurisdictions in the Interstate 8 and Interstate 10 Hidden Valley Transportation Framework study area. It is similar to the assessment of transportation resources prepared for the I-10/Hassayampa Valley Transportation Framework Study. The two framework studies together provide a comprehensive analysis of existing and potential transportation revenue for a major portion of central Arizona.

The chapter serves three purposes. First, it identifies and quantifies transportation revenue sources currently used by the Hidden Valley study area jurisdictions. The focus is on revenue sources that the jurisdictions are currently using, not sources that they are enabled to use. (For example, all of the jurisdictions except Arizona Department of Transportation can seek voter approval for general obligation bonds for transportation, but only one jurisdiction currently uses these bonds.)

Second, it develops reasonable methodologies and assumptions for projecting transportation revenue from the currently used sources into the future, from fiscal year (FY) 2008 to FY 2040. The purpose is not to quantify future revenue precisely, but to develop order-of-magnitude estimates of revenue that might be available over time.

Third, it sketches policy issues that Hidden Valley study area jurisdictions will face, individually and regionally, regarding transportation revenue in the future.

The study only briefly discusses transit revenues for two primary reasons. First, there are very limited transit services in the study area today, with only negligible expenditures for transit. For example, Valley Metro provides dial-a-ride service from Ajo, through Gila Bend, into Phoenix; and the city of Maricopa provides several daily trips to and from the Phoenix metropolitan area. Second, transit funding typically comes from the farebox, from the federal government (mostly for purchasing buses, but also for operations), and from general fund transfers to cover any shortfall. Arizona's Highway User Revenue Funds (HURF) cannot be used for transit, except for incidental improvements to the roadway, such as bus pullouts. Any recommendations for future transit service in the Hidden Valley study area will need to be accompanied by new revenue sources to provide local match for federal funding. Alternatively, the services could be provided with federal funding, which is deemed unlikely because local funding (to match the federal funds) would also need to increase markedly.

Unless otherwise stated, costs are reported in 2007 dollars.

7.2 Transportation Revenue Sources in Arizona and the Hidden Valley Study Area

Section 7.2 provides a brief overview of transportation revenue sources and presents revenue estimates for the study area jurisdictions, first in FY 2007 and then for FY 2008-2040.

The jurisdictions with surface transportation responsibilities in the study area include:

- Arizona Department of Transportation (ADOT)
- Maricopa County jurisdictions
    - Maricopa County Department of Transportation (MCDOT)
    - City of Avondale
    - Town of Buckeye
    - Town of Gila Bend
    - City of Goodyear
- Pinal County Jurisdictions
    - Pinal County
    - City of Casa Grande
    - City of Maricopa

Table 7.1 summarizes the transportation revenue sources currently available in Arizona and the Hidden Valley study area. "State-shared revenue" refers to the distribution of HURF revenue to the state highway system and to municipal and county governments. (HURF revenue is constitutionally restricted to roadway purposes and cannot be used for transit.) For counties, State-shared revenue also includes a statutory allocation of Vehicle License Tax revenue for "County Highway Purposes" (VLT/CHP). "Other revenue" refers to federal funds, grants, private donations, and miscellaneous sources. These other sources are described more fully under each city, town and county.

Table 7.1 Summary of Existing Transportation Revenue for Hidden Valley Study Area

	Transportation Revenue Sources								
		Sales Tax							
Jurisdiction	State Shared	County	Local	Construction	DIF	GFT	GOB	LTAF	Other
ADOT	✓	✓							✓
MCDOT	✓								✓
Avondale	✓		✓		✓	✓	✓		✓
Buckeye	✓			✓	✓				
Gila Bend	✓		✓			✓			
Goodyear	✓				✓	✓		✓	
Pinal County	✓	✓			✓				
Casa Grande*	✓	✓			✓			✓	✓
City of Maricopa*	✓	✓			✓				✓

*Refers to city's share of the Pinal County ½ percent excise tax for transportation.

DIF = Development Impact Fee
GFT = General Fund Transfer
GOB = General Obligation Bonds
LTAF = Local Transportation Assistance Fund
Source: Curtis Lueck & Associates

The information in Table 7.1 can be summarized as follows:

- State-shared revenue is common to all the Hidden Valley study area jurisdictions.
- Both Maricopa County and Pinal County have county sales taxes dedicated wholly or partially to roadway improvements. The Maricopa County sales tax (Proposition 400) allocates revenue to three programs--freeways, arterials, and public transportation--and identifies specific projects to be completed with the revenue from FY 2006 through FY 2026, when the tax will expire. ADOT is responsible for building and operating the freeways, which are the only Proposition 400 improvements in the Hidden Valley study area. Pinal County's sales tax for roadways only, which is effective from FY 2006 through 2026, is structured to allocate revenue by population to each jurisdiction, with the jurisdictions responsible for programming the revenue. Therefore, each Pinal County jurisdiction shows a county sales tax revenue source.
- Most incorporated jurisdictions levy a general sales tax, and two jurisdictions (Avondale and Gila Bend) currently devote a portion of their sales tax revenue to transportation.
- One jurisdiction (Buckeye) levies a construction sales tax, with revenue allocated to transportation.
- Six of the eight local jurisdictions collect transportation development impact fees. These fees are assessed against all new residential and non-residential development. Revenue raised can be spent only on improvements that are directly related to and proportionate to the impact of the new developments on the roadway systems. Only Maricopa County and Gila Bend do not have such fees. Maricopa County currently has an impact fee study underway for roadways and other purposes.
- One jurisdiction (Avondale) reports using voter-approved general obligation bonding for transportation capital improvements.
- While all jurisdictions received some Local Transportation Assistance Fund (LTAF) revenue, only two (Goodyear and Casa Grande) report on its use in annual budget documents. There are two LTAF funds: LTAF I, deriving from the Arizona Lottery, and LTAF II, deriving from the Powerball lottery game and the vehicle license tax. LTAF I is capped at $23 million per year, and so has lost much of its value to inflation. LTAFII is administered by ADOT, and the amount varies annually. The LTAF allocations are primarily intended for public transit, but may be used for roadway purposes in smaller jurisdictions. The distribution and use of LTAF are tracked and monitored by ADOT's Financial Management Services group.

The next two sections present estimates of FY 2007 revenue and projected FY 2008-2040 revenue for each jurisdiction by source. Several jurisdictions, including the two counties, lie only partially in the Hidden Valley study area. This analysis does not attempt to divide revenue between the study-area and non-study-area portions of each jurisdiction. Also, the revenue estimates for ADOT are statewide for state-shared revenue and federal funds, but specific to Maricopa County for the Regional Area Road Fund (RARF) revenue derived from Proposition 400. Thus, the ADOT data is not specific to Hidden Valley study area.

7.2.1 FY 2007 Transportation Revenue

FY 2007 ADOT Revenue

Table 7.2 shows the estimated revenue from the three major sources in ADOT's FY 2007 budget. Statewide, ADOT received $569 million (46 percent of its total revenue) from HURF, $454 million (36 percent) in federal funds, and $223 million (18 percent) from the Maricopa County RARF.

Table 7.2 FY 2007 ADOT Revenue

Revenue Source	FY 2007 ($ million)	Percent of Total
HURF	$569	46%
Federal funds	$454	36%
Maricopa County sales tax	$223	18%
Total	$1,246	100%

Source: ADOT FY 2007 year end reports on HURF and RARF and the FY 2007 to 2011 State Transportation Improvement Plan

ADOT's HURF revenue and federal funds are crucial to all areas of the state. In Maricopa and Pinal counties, the dedicated countywide sales tax revenue are also critical—for roads in Pinal County and for both roads and transit in Maricopa County.

FY 2007 Federal Revenue Allocations to Local Governments

A portion of Arizona's federal transportation revenue is allocated to local governments, reported as allocations to Maricopa Association of Governments (MAG), Pima Association of Governments (PAG), and other locals (in the remaining thirteen counties). Since FY 2000, there has been a federal transportation revenue allocation to "Optional Use by MAG, PAG, and Other Locals." The ADOT 5-Year State Transportation Improvement Plan, as shown in Table 7.3, reports the following allocations to local governments for FY 2007:

- Total federal revenue to local governments: $176 million;
- $118 million (67 percent) to MAG;
- $22 million (13 percent) to PAG;
- $13 million (8 percent) to locals outside Maricopa and Pima counties; and,
- $23 million (13 percent) for optional use by local governments.

Table 7.3 FY 2007 Federal Allocations to Local Governments

Recipient	Revenue ($ million)	% of Total
MAG	$118	67%
PAG	$22	13%
Other locals (e.g., CAAG)	$13	8%
Optional use by MAG, PAG, & other locals	$23	13%
Total	$176	100%*

*In this table and others, percents do not always add to 100 due to rounding.
Source: ADOT FY 2007 to 2011 State Transportation Improvement Plan

The Casa Grande Small Area Transportation Study (July 2007) reported that the Central Arizona Association of Governments (CAAG), which covers Pinal and Gila counties, has $1.8 million of federal funds available annually, which is included under "Other Locals" in Table 7.3. When combined with the reported MAG allocation for FY 2007 of $118 million, total federal funds to local governments potentially available to Hidden Valley jurisdictions was approximately $120 million.

FY 2007 Hidden Valley Study Area Jurisdiction Revenue

Table 7.4 provides estimates of revenue and revenue sources available to local jurisdictions in the Hidden Valley study area for FY 2007. Table 7.5 presents the same information, but without reporting the MCDOT data. The reason for reporting the numbers without MCDOT is that most of unincorporated Maricopa County lies outside the Hidden Valley study area.

Looking at all jurisdictions for the year, there was $252 million in available revenue. Nearly two-thirds of this ($164 million), however, was MCDOT revenue, available countywide and not just in the Hidden Valley portion of the county. Three-fifths of the available revenue was state-shared (HURF and VLT/CHP). The next largest source of revenue came from development impact fees ($24 million or 10 percent).

The three sales tax sources (county sales tax, local sales tax, and construction sales tax) accounted for a combined $19 million (8 percent). MCDOT accounted for most of the "other revenue" ($47 million of $49 million). Excluding MCDOT from the Hidden Valley jurisdictions (Table 7.5), state-shared revenue remains the largest source--$38 million (43 percent).

To sum up: in FY 2007, state-shared revenue (62 percent), development impact fees (10 percent), and sales taxes (8 percent) accounted for four-fifths of transportation revenue for jurisdictions in the Hidden Valley study area. This proportion is even greater (more than 90 percent) when MCDOT is excluded.

Table 7.4 Estimated Hidden Valley Transportation Revenue, FY 2007

	Transportation Revenue Sources ($ million)										
Jurisdiction	**State Shared Revenue**	**County Sales Tax**	**Local Sales Tax**	**Construction Sales Tax**	**DIF**	**GFT**	**GOB**	**LTAF**	**Other Revenue**	**Total**	**Percent of Total**
MCDOT	$117								$47	$164	65%
Avondale	$5		$3		$1		$1		$1	$11	4%
Buckeye	$2			$8	$1					$11	4%
Gila Bend	$<1									$<1	<1%
Goodyear	$3				$2	$3		$<1		$9	4%
Pinal County	$22	$5			$11					$38	15%
Casa Grande	$3	$2*			$2			$<1	$<1	$7	3%
City of Maricopa	$3	$1*			$7				$<1	$11	4%
Total	$155	$8	$3	$8	$24	$3	$1	$1	$49	$252	100%
Percent of Total	62%	3%	1%	3%	10%	1%	<1%	<1%	19%	100%	

*Refers to city's share of the Pinal County ½ percent excise tax for transportation.

DIF = Development Impact Fee
GFT = General Fund Transfer
GOB = General Obligation Bonds
LTAF = Local Transportation Assistance Fund

Source: Curtis Lueck & Associates

Table 7.5 Estimated Hidden Valley Transportation Revenue, FY 2007 without MCDOT, FY 2007

	Transportation Revenue Sources ($ million)										
Jurisdiction	**State Shared Revenue**	**County Sales Tax**	**Local Sales Tax**	**Construction Sales Tax**	**DIF**	**GFT**	**GOB**	**LTAF**	**Other Revenue**	**Total**	**Percent of Total**
Avondale	$5		$3		$1		$1		$1	$11	13%
Buckeye	$2			$8	$1					$11	13%
Gila Bend	$<1									$<1	<1%
Goodyear	$3				$2	$3		$<1		$9	10%
Pinal County	$22	$5			$11					$38	43%
Casa Grande	$3	$2*			$2			<1	<1	$7	8%
City of Maricopa	$3	$1*			$7				<1	$11	13%
Total	$38	$8	$3	$8	$24	$3	$1	$1	$2	$88	100%
Percent of Total	43%	9%	3%	9%	27%	3%	1%	1%	2%	100%	

*Refers to city's share of the Pinal County ½ percent excise tax for transportation.

DIF = Development Impact Fee
GFT = General Fund Transfer
GOB = General Obligation Bonds
LTAF = Local Transportation Assistance Fund

Source: Curtis Lueck & Associates

7.2.2 Projected Transportation Revenue

This section presents projections for transportation revenue from FY 2008 to FY 2040. Projections for ADOT and other jurisdictions are presented separately.

Projected ADOT Revenue

Table 7.6 shows projected ADOT revenue through FY 2040. In the future, HURF is expected to comprise a larger share of ADOT revenue: 63 percent from FY 2008 through 2040, versus 46 percent in FY 2007. The main reasons are that HURF revenue is projected to grow faster than federal funding (at least in the short run) and expiration of the Maricopa County transportation sales tax at the end of 2025.

Table 7.6 Projected ADOT Revenue

Revenue Source	Projected FY 2008 to 2040 ($ million)	% of Total
HURF	$59,392	63%
Federal Funds	$26,600	28%
Maricopa County Excise Tax	$8,119	9%
Total	$94,111	100%

Source: Curtis Lueck & Associates

Projected Federal Revenue Allocations to Local Governments

The FY 2007–2011 ADOT State Transportation Improvement Plan projects allocations of federal revenue to MAG of approximately $118 million in FY 2008, $123 million in FY 2009, and $124 million in both 2010 and 2011. Our analysis assumes that revenue will then remain stable at $124 million per year through 2040. For CAAG, the analysis assumes a recurrent $1.8 million per year (equaling the current allocation) throughout the period.

Based on these assumptions, MAG would receive $4.076 billion in federal revenue through 2040; CAAG would receive $59 million; and the total potential federal allocations to local governments in the Hidden Valley area would be $4.135 billion, as Table 7.7 shows.

Table 7.7 Projected Federal Transportation Allocations to MAG and CAAG

Years	Projected MAG Revenue ($ million)	Projected CAAG Revenue ($ million)	Projected Total Revenue ($ million)
FY 2008 - 2010	$365	$5	$370
FY 2011 - 2020	$1,237	$18	$1,255
FY 2021 - 2030	$1,237	$18	$1,255
FY 2031 - 2040	$1,237	$18	$1,255
Total	$4,076	$59	$4,135

Source: Curtis Lueck & Associates

Projected Hidden Valley Study Area Jurisdiction Revenue

Table 7.8 presents transportation revenue projections for the Hidden Valley area jurisdictions, including MCDOT. Tables 7.4 and 7.8 together show that state-shared revenue is expected to contribute a larger share of revenue in 2008-2040 than in 2007: 74 percent versus 60 percent. Sales tax revenue and development impact fees will make up a slightly larger share of transportation revenue than today. Sales tax revenue accounts for 12 percent of revenue from 2008 through 2040, versus 9 percent in FY 2007. Projected development impact fee revenue remains 10 percent of the total.

Table 7.8 Projected Hidden Valley Transportation Revenue, FY 2008 to 2040

	Transportation Revenue Sources ($ million)										
Jurisdiction	State Shared Revenue	County Sales Tax	Local Sales Tax	Construction Sales Tax	DIF	GFT	GOB	LTAF	Other Revenue	Total	Percent
MCDOT	$9,957								$661	$10,618	56%
Avondale	$372		$233		$31	$38	$75		$26	$775	4%
Buckeye	$565			$844	$74					$1,483	8%
Gila Bend	$13									$13	<1%
Goodyear	$489				$127	$66		$15		$697	4%
Pinal County	$2,070	$412			$756					$3,238	17%
Casa Grande	$245	$167			$186			$7	$6	$611	3%
City of Maricopa	$240	$93	$515		$663				$25	$1,536	8%
Total	$13,951	$672	$748	$844	$1,837	$104	$75	$22	$718	$18,971	100%
Percent of Total	74%	4%	4%	4%	10%	1%	<1%	<1%	4%	100%	

DIF = Development Impact Fee
GFT = General Fund Transfer
GOB = General Obligation Bonds
LTAF = Local Transportation Assistance Fund

Source: Curtis Lueck & Associates

7.3 Overview of Transportation Revenue Sources

This section gives an overview of transportation revenue sources, how they are paid, who pays them, who collects them, and how they are used.[1] The overview provides a national benchmark of transportation revenue with which to compare Hidden Valley transportation revenue.

7.3.1 Basic Sources of Transportation Revenue

There are many sources and types of transportation revenue, each with its own advantages and limitations. No single source meets all of the needs, so jurisdictions must rely on multiple revenue streams. Most major transportation sources are public revenue, levied and collected as taxes by federal, state and local governments. Public-private partnerships and direct private ownership, operation and maintenance of transportation facilities do occur, however, and could become more prominent in the future.

Some transportation revenue comes from direct user taxes and fees, such as the (per gallon) tax on gasoline sales, the vehicle license tax, toll roads, and transit fares. These taxes and fees are assessed on the users of transportation systems, to offset the demands that users make for new capital investments as well as for operations and maintenance. In Arizona, the user fees and fuel taxes for a mid-size car amount to about two of the 57 cents per mile to own and operate the vehicle.[2] The amount is different in other states because their taxes and fee structure are different.

Other transportation revenue consists of indirect taxes and fees levied by governments that allocate the revenue to transportation purposes. Property taxes and sales taxes are the primary sources of indirect transportation revenue. They are considered indirect because they are imposed on the taxpaying public at large, rather than on transportation system users in particular.

Table 7.9 presents a simplified profile of transportation revenue, distinguishing between direct user taxes and fees, and indirect taxes and fees.

Direct User Taxes and Fees

Direct user taxes and fees include motor fuel taxes, vehicle license and registration taxes and fees, fees based on vehicle weight, tolls and fares, and other fees.

Sale of Motor Vehicle Fuel

The primary component of direct user taxes and fees, these taxes are typically levied as cents per gallon. Some states impose a sales tax on fuel sales instead of, or in addition to, the cents-per-gallon tax. The federal government and the state of Arizona collect taxes on the sales of gasoline at 18.3 cents per gallon[3] and 18 cents per gallon. The federal government and Arizona collect taxes on diesel fuels; the federal government collects taxes on the sales of alternative fuels (such as liquefied petroleum and natural gas, compressed natural gas, and E-85), but at lower rates. Motor fuel taxes are paid by the general motoring public (passenger cars) and owners of commercial vehicles. A few states index the tax rate to inflation, but Arizona—whose fuel tax rate has not increased since 1991--does not. If adjusted for inflation since the last increase, the Arizona rate would be 39 cents today. (Source: Center for Transportation Excellence, "Paying for Progress: 2008 State Transportation Funding & Finance Scorecard.") Rates in other states range from 8 cents in Alaska to 32.9 cents in Wisconsin. Revenue from fuel sales is relatively predictable because the volume of sales changes little in response to price fluctuations (i.e., consumer demand for gasoline is inelastic with respect to price). However, improvements in vehicle fuel economy reduce fuel sales, and hence revenue from the tax. At 20 miles per gallon, a person driving 15,000 miles per year pays about $135 in Arizona gasoline tax and $137 in federal gasoline tax.

Vehicle License Tax (VLT)

A second significant source of direct user taxes and fees, the VLT is imposed by the state of Arizona and collected annually. It is a personal property tax on motor vehicles, based on statutorily defined formulas rather than direct market values. These fees are paid by all vehicle owners, at the time of initial licensing and on annual license renewal. In Arizona, the amount decreases as the vehicle depreciates. Therefore, VLT receipts are largely driven by new car sales. The VLT on a typical $25,000 new car is about $420 and drops about 16 percent per year. As discussed later, only a portion of the VLT is dedicated to transportation purposes.

Table 7.9 Transportation Revenue Overview

Revenue Sources	How Paid	Who Collects	Who Pays
Direct User Taxes and Fees			
Fuel Sales			
Gasoline Sales	Typically charged as cents-per-gallon and charged at the pump	Federal/state	Passenger/commercial vehicles
Diesel Fuel sales	Typically charged as cents-per-gallon and charged at the pump	Federal/state	Commercial vehicles
Alternate Fuels	Typically charged as cents-per-gallon and charged at the pump	Federal	Alternate fuel users
Vehicle License/Registration Fees			
Vehicle License Fees	Fees based upon the value of the vehicle ("ad valorem"), assessed annually	State	All vehicle owners
Vehicle Registration/Title Fees	Typically one-time fees paid at the time of the initial vehicle registration	State	All vehicle owners
Vehicle Weight Taxes and Fees	Taxes and fees assessed against vehicles above specified weights		
Truck and trailer sales	Sales taxes on trucks and trailers above specified weight	Federal	Commercial vehicles
Tires	Cents per each 10 pounds over rated loads in excess of 3,5000 pounds	Federal	Commercial vehicles
Heavy Vehicle Use	Annual taxes on trucks over a specified gross vehicle weight	Federal/state	Commercial vehicles
Tolls and Fares			
Toll Roads	Tolls paid for use of roadways	State or interstate agencies/private entities	All vehicles using roadway
Transit Fares	Fares paid by transit riders	Local	Transit riders
Other Miscellaneous Fees	Various fees charged for operators licenses, specialized license plates, requests for special services, licenses and permits	State/local	Varies

Table 7.9 Continued

Revenue Sources	How Paid	Who Collects	Who Pays
Indirect Taxes and Fees			
Property Taxes/Assessments			
Primary Property Taxes	Taxes on assessed property valuations, collected annually, with some general fund revenues allocated to transportation	Local	All property owners
Secondary Property Taxes	Taxes on assessed property valuations, collected annually, for debt service on general obligation bond debt allocated to transportation capital improvements	Local	All property owners
Improvement and Community Facilities Districts	Assessments or property taxes against properties in specified geographic areas to pay for improvements benefiting the area	Local	All property owners in district
Development Impact Fees	One-time fees against new residential and non-residential property development, to offset the costs of transportation demand generated by the new development	Local	All new development
Private Contributions	Exactions/conditions of rezoning/dedications (of right-of-way), construction and other "in lieu" payments	Local	Private developers
Revenue Sources	**How Paid**	**Who Collects**	**Who Pays**
Sales Taxes			
General Sales Tax	Taxes levied on sales of taxable items, with all or some of the proceeds provided for transportation	Local	All purchasers of taxable goods and services
Transportation Sales Tax	Taxes levied on sales of taxable items, with all proceeds dedicated to transportation	Local	All purchasers of taxable goods and services
Construction Sales Tax	A tax levied on all construction activity, in addition to general sales taxes, with all or a portion of the proceeds dedicated to transportation	Local	All purchasers of taxable goods and services

Source: Curtis Lueck & Associates

Vehicle Registration/Title Fees

Vehicle registration fees and certificate of title fees typically are minor charges. For motor vehicles in Arizona, the certificate of title costs $4 and the annual registration fee is $8.[4] These fees are collected by the state and paid by all vehicle owners.[5]

Vehicle Weight Charges

The federal government and states also assess fees based on vehicle weight. These charges are typically levied against large trucks and trailers, to recoup some of the extra wear and tear that heavy vehicles impose on roadways. The federal government assesses sales taxes on trucks and trailers above a specified weight, and on large tires with rated loads in excess of 3,500 pounds. Both the federal government and states impose charges against "heavy-vehicle use" as well. Arizona imposes a commercial registration fee and a "gross weight fee" for designated vehicles that increases with the vehicle weight, from $7.50 for vehicles up to 8,000 pounds gross weight to $918 for vehicles with a gross weight of 75,001 to 80,000 pounds[6] These charges are paid by owners/operators of large commercial vehicles.

Toll Roads

Toll roads are operated by public toll road agencies or by private entities. Tolls are usually based on miles traveled and paid by all users of the road. Toll charges typically range from 5 cents to 15 cents per mile for passenger cars and twice that for commercial vehicles, and can vary by time of day and congestion level.[7] Interest has grown in both selling existing public toll road systems to private investors, and asking private investors to build, own (or lease long-term) and operate new toll roads. Arizona considered toll roads in the 1990s for the Phoenix area, but the interest was short-lived and none were constructed. Most toll roads have fully controlled access. In recent decades, vehicle transponder technology and automatic billing have enabled many users to bypass the traditional toll plazas. These users receive a monthly bill based on miles driven.

Indirect Taxes and Fees

Direct user taxes and fees typically do not generate enough revenue to meet all capital, operation, and maintenance costs of the transportation system. Many local governments enhance transportation revenue by levying indirect taxes and fees on the two principal sources of local revenue – real property and retail sales.

Real Property Taxes and Fees

Real property taxes and fees can be primary or secondary property taxes, taxes against improvement districts or community facilities districts, or development impact fees.

Primary Property Taxes

Primary property taxes are collected by local governments, based on assessed valuations ("ad valorem" in Latin), and collected annually. Primary property taxes are deposited in the local government's general fund, and some governments allocate a portion of this revenue to transportation.

Secondary Property Taxes

Secondary property taxes are also "ad valorem", but they are levied to pay debt service on general obligation bonds approved by voters. General obligation bond debt has been used to fund transportation capital investments in Arizona and around the country.

Improvement Districts or Community Facilities Districts

Many local governments form improvement district or community facilities districts, which are special taxing districts that can be formed to fund capital improvements, operations and maintenance, or both. The districts are funded through assessments placed on all benefiting properties within the district. The Arizona enabling legislation is slightly different for counties than for municipalities.

Development Impact Fees, Exactions, and "In Lieu" Fees

Development impact fees have become a common source of revenue for local governments, notably for transportation capital improvements. Impact fees are charged against new development, usually both residential and non-residential, to offset the costs of new travel demand generated by the development. These fees are paid by developers at the time of building permit issuance, and are typically passed along to the owners and tenants. The fees cannot be used to cure existing deficiencies or for non-capital expenditures. In Arizona, jurisdictions that impose impact fees must prepare annual reports that simplify tracking the revenue. Impact fees for roads range from a few hundred dollars to $10,000 per new house. The fees for non-residential uses also vary widely. Impact fees must be demonstrably proportionate to the actual cost of accommodating travel demand due to the development.

Property development may also generate transportation revenue in the form of private contributions, such as exactions and other conditions of rezoning, developer contributions (typically of right-of-way for public improvements), and direct developer construction of improvements or payments "in lieu" of construction. Contributions may be either in cash or in kind.

Local Sales Taxes

Sales taxes are a major source of transportation revenue in many states, including Arizona, where local sales taxes are levied in addition to the state rate of 5.6 percent, of which 0.6 percent is earmarked for public education and 5 percent goes to the state's general fund. Local sales taxes may be levied for general purposes or earmarked for specific uses such as transportation. Unlike cities and towns, Arizona counties lack the authority to charge a general sales tax.

Local General Sales Taxes (Cities and Towns)

Local general sales taxes are levied against all taxable sales, typically as a percent of the purchase price, and are usually deposited in the general fund. Some local governments allocate a portion of their general fund revenue to transportation. The total local sales tax rate is not prescribed by state law, but may be limited by municipal charter. Most cities charge a 1.5 percent to 2.0 percent sales tax. In communities with balanced land uses, sales taxes are large and relatively reliable revenue producers, typically generating at least $150 per capita per year for each percent of the tax rate.

Transportation Sales Taxes

Some local governments levy transportation sales taxes on all taxable sales, with all of the proceeds dedicated to transportation. This revenue is typically deposited in special accounts and tracked separately from other government accounts. In Arizona, governments have used both regional transportation sales taxes, levied countywide, and local transportation sales taxes, levied by cities and towns. In many cases, voters are asked to approve a sales tax for specific projects, such as the roadway and transit improvements in the adopted MAG Regional Transportation Plan.

Construction Sales Taxes

In addition to general sales tax, some municipalities levy incremental sales taxes on certain construction-related activities.[8] This revenue, which is statutorily based on 65 percent of the sale or contract price, is then earmarked for transportation. The tax is collected on new homes and other activities that involve a construction contract, such as installing a swimming pool, re-roofing, or recurring structural maintenance. Activities subject to the tax are defined by local policy or adopted ordinance. A 2 percent construction sales tax on a typical $300,000 new home generates about $3,900 ($300,000 x 2 percent x 0.65) in revenue.[9]

Some Basics on Federal and State Highway Revenue

This section provides basic information on federal and state of Arizona highway revenue. Both federal and state revenue are somewhat complex in their sources and allocation procedures.

Federal Highway Revenue

Federal transportation revenue and spending are governed by authorization bills enacted by Congress. The current authorizing legislation is "The *Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users*" (SAFETEA–LU), signed into law on August 10, 2005. Federal transportation revenue is collected from motor fuel taxes and vehicle

weight-related taxes, as shown in Table 7.10. Federal funding is deposited into either the highway account or the mass transit account of the Highway Trust Fund.[10]

The federal government collects taxes on gasoline, diesel fuel, and five forms of alternative fuels. With the exception of compressed natural gas, these taxes are imposed on a cents-per-gallon basis, with the rate for gasoline being $0.183/gallon and for diesel $0.243/gallon. These tax rates have been in effect since the early 1990s. Gasohol is also taxed at $0.183/gallon, but the tax rates on other alternative fuels are lower.

The federal government also collects taxes on the sale of tires used for vehicles with a gross vehicle weight in excess of 3,500 pounds; on the sale of trucks and trailers in excess of 55,000 pounds and 26,000 pounds (respectively); and (annually) on trucks over 55,000 pounds.

Depending on the type of fuel, 80 percent to 88 percent of the motor fuel tax revenue is deposited in the highway account of the trust fund (with the remainder going to the mass transit account). All of the truck-related taxes are deposited into this account. Revenue in the highway account is allocated among a number of programs, as Table 7.11 shows. Four programs account for 55 percent of federal highway authorizations: Interstate Maintenance Program, National Highway System, Bridge Program, and Surface Transportation Program. These four, plus the Equity Bonus Program, account for 76 percent of the authorizations.[11]

Table 7.10 Federal Highway User Taxes and Allocations

		Distribution of Tax	
Type of Excise Tax	**Tax Rates (cents/gallon)**	**Highway Account**	**Mass Transit Account**
Gasoline	18.3	84%	16%
Diesel	24.3	88%	12%
Gasohol	18.3	84%	16%
Liquefied petroleum gas	13.6	84%	16%
Liquefied natural gas	11.9	84%	16%
M85 (from natural gas)	9.15	84%	16%
Compressed natural gas	48.54/1,000 cu. ft.	80%	20%
Tires	9.45 cents/10 lbs	100%	0%
Truck and trailer sales	12% of sales price	100%	0%
Heavy-vehicle use	Weight-based—max $550	100%	0%

Source: U.S. Government Accountability Office, "Highway Trust Fund: Overview of Highway Trust Fund Estimates," Table 1, page 4, April 4, 2006

Table 7.11 Federal Highway Account Program Categories

Authorization Category	5-Year Authorizations ($ million)	% of Total
Interstate Maintenance Program	$25,202	13%
National Highway System	$30,542	15%
Bridge Program	$21,607	11%
Surface Transportation Program	$32,550	16%
Equity Bonus Program	$40,896	21%
High Priority Projects Program	$14,832	7%
Congestion Mitigation/Air Quality Improvement Program	$8,609	4%
Highway Safety Improvement Program	$5,064	3%
Coordinated Border Infrastructure Program	$833	<1%
Safe Routes to School Program	$612	<1%
Other Programs	$18,744	9%
Total	$199,491	100%

Source: Federal Highway Administration, "Highway Authorizations: Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (Public Law 109-59)," April 6, 2006

State-shared Revenue

The state of Arizona shares transportation revenue with counties, cities and towns through allocations from HURF, and through a small allocation of (non-HURF) VLT revenue to counties for transportation. The percentages of each allocation are fixed by statute.

HURF Revenue

Arizona collects an array of user-related taxes and fees, which are then deposited in the HURF account. HURF is a primary source of transportation funds for ADOT, municipalities, and counties. In FY 2006, HURF generated about $71 per resident of Maricopa County municipalities, $73 per resident of Pinal County municipalities, $435 per resident of unincorporated Maricopa County, and $120 per resident of unincorporated Pinal County.

The major transportation revenue sources that the state collects are gasoline taxes, use fuel (diesel) taxes, vehicle license taxes, registration fees, and other fees. Table 7.12 shows that, from FY 1988 through 2007, gasoline taxes were the single largest source of HURF revenue, providing 41 percent of the total ($7.56 billion[12]). The next largest source of revenue was the transportation-dedicated portion of the VLT, which accounted for 21 percent (approximately $4 billion) of collections. Diesel fuel taxes accounted for 14 percent, followed by vehicle registration fees at 12 percent. Motor carrier (commercial vehicle) fees made up 8 percent of the total, with various other fees accounting for the remaining 4 percent.[13] All of these taxes and fees are assessed at a fixed rate (not indexed or responsive to inflation) except the VLT, which reflects the changing price of new motor vehicles.

Table 7.12 HURF Collections, FY 1988 to FY 2007

	Total Revenue ($ thousand)							
Fiscal Year	Gas Tax	Vehicle License Tax	Diesel Fuel Tax	Motor Carrier	Registration Fees	Other	General Fund Transfer	Total
1988	$267,318	$79,240	$47,610	$98,707	$79,090	$22,996	$12,422	$607,383
1989	$286,101	$80,125	$50,797	$104,709	$80,338	$23,402	$13,789	$639,261
1990	$286,240	$91,390	$52,876	$104,343	$88,536	$25,474	$15,198	$664,057
1991	$296,816	$92,826	$65,202	$108,655	$75,657	$24,033	$16,632	$679,821
1992	$307,879	$96,146	$61,910	$109,573	$74,180	$25,507		$675,195
1993	$315,227	$105,027	$72,008	$120,303	$80,717	$24,161		$717,443
1994	$334,643	$113,990	$87,913	$118,530	$83,826	$37,161		$776,063
1995	$342,299	$131,562	$108,790	$92,103	$86,159	$39,238		$800,151
1996	$358,961	$160,145	$114,780	$85,433	$97,601	$42,654		$859,574
1997	$363,953	$175,253	$124,748	$90,186	$101,528	$41,294		$896,962
1998	$366,377	$176,950	$142,167	$56,123	$109,445	$36,425		$887,487
1999	$397,463	$220,126	$160,312	$34,150	$131,952	$38,775		$982,778
2000	$409,137	$236,547	$156,599	$36,563	$140,345	$40,409		$1,019,600
2001	$418,400	$251,613	$155,859	$32,678	$132,269	$40,147		$1,030,966
2002	$434,818	$270,641	$161,507	$29,347	$138,210	$41,873		$1,076,396
2003	$446,891	$281,947	$166,744	$32,856	$141,328	$41,490		$1,111,256
2004	$463,531	$312,262	$179,002	$34,617	$146,638	$43,510		$1,179,560
2005	$481,284	$328,232	$194,368	$37,980	$154,122	$49,567		$1,245,553
2006	$489,081	$373,864	$213,460	$40,504	$158,805	$55,911		$1,331,625
2007	$497,702	$393,497	$210,282	$45,226	$177,788	$57,979		$1,382,474
	$7,564,121	$3,971,383	$2,526,934	$1,412,586	$2,278,534	$752,006	$58,041	$18,563,605
Total	41%	21%	14%	8%	12%	4%	<1%	100%

Note Details may not add to the totals due to rounding
Source: Arizona Department of Transportation, Annual Report for Fiscal Years 1998 to 2007

State statutes prescribe how HURF revenue is allocated to the State Highway Fund and to cities, towns and counties (Table 7.13). Just over one-half of HURF (approximately 51 percent) is distributed to the State Highway Fund—including 8 percent to Maricopa and Pima counties for controlled-access highways, leaving 43 percent for ADOT discretionary programs involving state highway projects throughout Arizona. Cities and towns receive 28 percent of HURF revenue and counties 19 percent. These funds are disbursed among the jurisdictions based on population and origin of fuel sales. Phoenix, Tucson, and Mesa, the three largest cities, share the remaining 3 percent of HURF revenue (in addition to their portion of the 28 percent), allocated among the jurisdictions by population.

Table 7.13 HURF Allocation Formulas

Distribution Breakdown	Distribution Formulas
50.5% to State Highway Fund	7.67% to Maricopa and Pima Counties for controlled access, with a 75%/25% split between them; 42.83% to ADOT Discretionary
27.5% to (all) cities and towns	One-half distributed by incorporated population, and one-half by county origin of gasoline sales and city or town population within each county
3% to cities over 300,000	Distributed to Phoenix, Tucson, and Mesa based on population
19% to counties	Distributed in part by gasoline distribution and diesel consumption (72%), and in part by unincorporated population (28%)

Source: FY 2007 Year End HURF Report

Vehicle License Tax Revenue (County Highway Purposes)

Table 7.14 presents the allocation of state VLT for FY 2007. Approximately 45 percent of VLT collections were deposited into the HURF, which were then allocated as described under "HURF Revenue." Another 5.83 percent of VLT revenue was distributed among the fifteen Arizona counties for highway purposes. The remaining 49 percent of VLT revenue went to the general funds of the state, counties, cities and towns.[14]

Table 7.14 Allocation of State Vehicle License Tax Revenue, FY 2008 ($ Million)

Category	Distribution	% of Total
Highway User Revenue Fund	$394	45%
State Highway Fund	$<1	<1%
County General Fund	$215	25%
Cities/Towns Fund	$215	25%
State General Fund (School Aid)	$1	<1%
State Highway Fund	$<1	<1%
Counties (Highway Purposes)	$51	6%
Total	$876	100%

Source: FY 2007 Year End Report, ADOT

Local Transportation Assistance Fund

There are two Local Transportation Assistance Fund (LTAF) accounts. LTAF I is funded from state lottery proceeds, up to $23 million per year (not indexed for inflation). The funds are distributed to cities and towns—but not counties--by population. The funds must be used for public transportation or for general transportation purposes, depending on population. The specific use of the funds is decided locally. Municipalities larger than 300,000 must use the funds solely for public transit; smaller jurisdictions may use it for transit or roads.

The legislature created LTAF II in 1998 to provide additional state transit and transportation funding to cities, towns and counties. The LTAF II funding, capped at $18 million per year, comes from the multistate Powerball lottery game and instant bingo game monies, along with a portion of the State Highway Fund's VLT money. ADOT administers LTAF II and funds are distributed to metropolitan planning organizations (or the Regional Public Transportation Authority in a county where one exists), and directly to cities, towns and counties not represented by an RPTA or MPO.[15] ADOT administers this program and awards are based on an application process. Funds must be used for public transit unless a jurisdiction receives less than $2,500 in a calendar year. At the jurisdictional level, LTAF II is not deemed a reliable revenue source because the total annual allocation varies, and the distributions are made competitively. Statewide LTAF II distributions were $10.1 million for FY 2008.

7.3.2 Comparing Arizona and Hidden Valley Transportation Revenue to National Data

Review of National Data on Transportation Revenue

The National Cooperative Highway Research Program report, "Future Funding Options to Meet Highway and Transit Needs" (hereafter "NCHRP report"), provides national data on funding that permits comparison with data on Arizona and the Hidden Valley jurisdictions.

The NCHRP report classifies funding sources as user fees, specialized taxes, and general taxes, as Table 7.15 shows.

User Fees

The NCHRP report divides user fees into direct fees, such as tolls and transit fares, and indirect fees, such as motor fuel taxes, vehicle license tax, registration and sales taxes, and taxes on tires.

Specialized Taxes

These are non-user taxes and fees that are collected on non-transportation uses, but with the revenue dedicated to transportation. Examples of specialized taxes commonly used in Arizona are transportation excise (sales) taxes, roadway development impact fees, and secondary property taxes used to retire transportation general obligation bond issues. Impact fees for public transit are used in some other states (California, Florida), but are not currently allowed in Arizona.

General Taxes

These are taxes collected for broad purposes, but with some of the revenue used for transportation. Examples are income taxes, general sales taxes, and primary property taxes.

NCHRP calculated nationwide highway revenue from all three sources in 2004 at $129 billion. Exhibit 7.15 shows the percent of this $129 billion that came from each of the three sources.

Table 7.15 Percent of Revenue by Source, Highway Mode Only, FY 2004 ($ Billion)

Funding Category	Revenue Collected	% of Total
User Fees	$83	64%
Specialized Taxes	$15	12%
General Taxes	$31	24%
Total	$129	100%

Source: National Cooperative Highway Research Program, "Future Financing Options to Meet Highway and Transit Needs," Table 2.3

The NCHRP report also distinguishes between the level of government that collects the tax or fee—-federal, state, or local. Table 7.16 shows the nationwide composition of taxes/fees used for highway purposes by level of government.

- The federal and state governments rely almost exclusively on user fees (93 percent and 83 percent respectively).
- Local governments collect 60 percent of their highway dollars from general taxes and 32 percent from specialized taxes. The remaining 8 percent comes from a range of other taxes and fees. Local governments typically do not collect user fees.

The NCHRP report further discusses the sources of state and local highway revenue.

- State governments rely very heavily on fees from users and owners of motor vehicles. According to the NCHRP report, "Motor fuel taxes and motor vehicle taxes and fees … (account) for 73 to 80 percent of total state highway funding over the last 25 years."
- At the local level, general taxes in the form of "general fund and property taxes … accounted for about two-thirds of total highway funds." The NCHRP report notes that, over the last 25 years, specialized taxes have come to account for a larger share of local government highway revenue.

Table 7.16 Revenue Source, Highway Mode Only, by Level of Government, FY 2004 ($ Billion)

	Federal		State		Local	
Funding Category	Revenue Collected	% of Total	Revenue Collected	% of Total	Revenue Collected	% of Total
User Fees	$28.6	93%	$51.5	82%	$2.8	8%
Specialized Taxes	$0.3	1%	$3.5	6%	$11.6	32%
General Taxes	$2.0	7%	$7.4	12%	$21.7	60%
Total	$30.9	100%	$62.5	100%	$36.1	100%

Source: National Cooperative Highway Research Program, "Future Financing Options to Meet Highway and Transit Needs," Table 2.3

Comparison of Arizona and Hidden Valley Study Area Transportation Revenue to National Data

Arizona Statewide HURF Revenue

Table 7.17 reports the sources of FY 2007 HURF collections, which exclude federal funding available to ADOT. Just over one-half (51 percent) of HURF revenue came from motor fuel taxes (principally the gasoline tax) and 41 percent came from vehicle-related taxes and fees (principally the VLT). In all, 93 percent of HURF collections came from motor fuel taxes and vehicle-related taxes and fees—higher than the 82 percent for all states reported in Table 7.16).

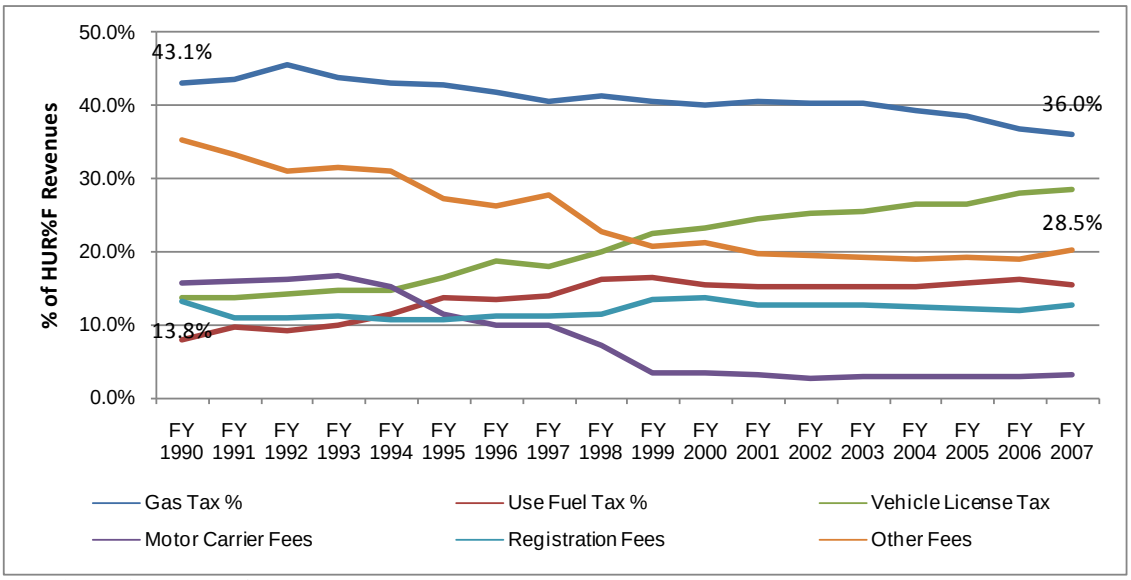
Table 7.17 Sources of Arizona HURF (FY 2007)

Revenue Source	FY 2007 Collections ($000)	Percent of Total
Motor Fuel Taxes	$707,984	51%
Gasoline Tax	$497,702	36%
Diesel Fuel Tax	$210,282	15%
Vehicle-Related Taxes/Fees	$571,285	41%
Vehicle License Tax	$393,497	29%
Registration Fees	$177,788	13%
All Other Taxes/Fees	$103,205	8%
Motor Carrier Fees	$45,226	3%
Other Revenue	$57,979	4%
Total Revenue	$1,382,474	100%

Source: National Cooperative Highway Research Program, "Future Financing Options to Meet Highway and Transit Needs," Table 2.3

The composition of HURF revenue shifted from 1990 to 2007, as Figure 7-1 shows. The gasoline tax declined as a percent of HURF revenue from 43 percent in FY 1990 to 36 percent in FY 2007, while the VLT increased from 14 percent to 29 percent. This is a function of the erosion of fuel tax revenue by inflation and improving fuel economy.

Figure 7-1 Source of HURF Collections, FY 1990 to 2007 (Percent)



Source: Curtis Lueck & Associates

The American Petroleum Institute maintains a database on state motor fuel taxes.[16] Arizona's gasoline tax of 18 cents per gallon ranks thirty-second among the 51 states (including DC). Four other states are also at 18 cents per gallon, leaving fifteen states with a lower gasoline tax. The average gasoline tax nationwide is 18.2 cents per gallon. The Arizona diesel tax is 26 cents per gallon--about 3 cents below the national average.

One other comparison of Arizona with other states is instructive: how is state transportation revenue allocated? The Brookings Institution study, "Fueling Transportation Finance: A Primer on the Gas Tax," reports the disposition of state motor fuel tax receipts for 1998–2001 to four categories:

- State-administered highways
- Local roads and streets
- Mass transit purposes
- General fund and non-highway uses

Nationwide, the proportion allocated to state-administered highways was 62 percent. Arizona ranked 39th in this respect, allocating 47 percent of its highway revenue to state-administered highways. On the other hand, Arizona allocated 52 percent to local road and streets, the fifth highest, compared with an average of 29 percent nationwide. The Arizona constitution prohibits the use of motor fuel taxes for non-highway purposes. Also, the percent of urban and rural roadway miles in the state highway system varies substantially from one state to another.

Local Transportation Revenue

Local jurisdictions can collect only the revenue authorized by state statutes. In Arizona, no local jurisdiction is authorized to collect direct highway user taxes and fees, such as gasoline taxes or vehicle license taxes, although jurisdictions may impose transit fares. The revenue sources that are authorized for use by local jurisdictions are primarily indirect taxes and taxes on real property or sales. Table 7.18 summarizes the indirect taxes and fees that local Arizona jurisdictions may use, and identifies which Hidden Valley jurisdictions currently use each source.[17]

Table 7.19 provides details of local government transportation revenue in the Hidden Valley study area. The table first compares revenue in three categories: state-shared HURF and VLT (including the 5.83 percent set-aside for county highway purposes, per ARS 28-5808), specialized taxes, and general taxes. It conveys the importance of state-shared revenue to local governments. State-shared revenue accounted for 62 percent of local government revenue in 2007, specialized taxes for 32 percent and general taxes for 6 percent. Tribal revenue is not included, owing to the relatively small amount and restriction to tribal transportation purposes.

In Table 7.19, "Specialized Taxes" and "General Taxes" refer to highway revenue generated by the local governments. The Hidden Valley jurisdictions generated $95 million in specialized and general taxes, of which 84 percent came from specialized taxes, versus 32 percent of locally generated revenue nationwide (Table 7.16). Neither MCDOT nor Pinal County uses general taxes for highway purposes.

Table 7.18 Local Transportation Revenue Sources Currently Authorized and Used

	Sources	MCDOT	Avondale	Buckeye	Gila Bend	Goodyear	Pinal County	Casa Grande	Maricopa
Property Related Taxes and Fees	Primary Property Taxes	≠	☐	≠	☐	☐	≠	≠	≠
	Secondary Property Taxes	≠	☐	≠	≠	≠	≠	≠	≠
	Improvement or Community Facilities Districts	≠	≠	☐	≠	≠	≠	≠	≠
	Development Impact Fees	≠	☐	☐	≠	☐	☐	☐	☐
	Private Contributions	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk
Sales Taxes	General Sales Tax	0	☐	≠	☐	☐	0	≠	≠
	Transportation Sales Tax	0	≠	≠	≠	☐	☐	☐	≠
	Construction Sales Tax	0	≠	☐	≠	≠	0	≠	≠

☐	Authorized and used
≠	Authorized but not used
0	Not authorized

Unk Unknown due to lack of data
Source: Curtis Lueck & Associates

Table 7.19 Local Jurisdiction FY 2007 Transportation Revenue

All Jurisdictions and Revenue Sources ($ million)				
Jurisdiction	**State Shared Revenues**	**Specialized Taxes**	**General Taxes**	**Total**
MCDOT	$116.8	$47.1		$163.9
Avondale	$4.9	$1.9	$3.4	$10.2
Buckeye	$1.8	$1.1	$7.9	$10.8
Goodyear	$3.3	$1.7	$3.8	$8.8
Pinal County	$22.2	$16.1		$38.3
Casa Grande	$3.1	$3.5	$0.4	$7.0
City of Maricopa	$2.5	$8.0		$10.5
	$154.6	$79.4	$15.5	$249.5
Total	62%	32%	6%	100%

Source: Curtis Lueck & Associates

7.3.3 Transportation Funding Source Options

This section identifies a menu of transportation funding options that are or could be available to the state and Hidden Valley jurisdictions. The NCHRP report presented a checklist of transportation revenue options, as adapted and shown in Table 7.20. The following text and tables identify, from this list of options, (a) sources currently available in Arizona, (b) sources used in other states that would require state legislative action for use here, and (c) those options that are considered innovative finance options.

One of the most innovative concepts is the vehicle-mile of travel charge, in which a vehicle's use of the highway network is tracked via global position systems. In Oregon's successful pilot programs, a fee is based on the amount of travel, route, and time of day, instead of a flat-rate gasoline tax.

Table 7.20 NCHRP Transportation Revenue Options

Revenue Tool	Scope: Preservation & Maintenance	Scope: New Capacity	Scope: Program or Project	Potential Yield	Where Used
Fuel Taxes					
Motor fuel excise (per gallon) tax	✓	✓	✓	High	All states, federal
Indexing of the motor fuel tax (can be indexed to inflation or to other factors)	✓	✓	✓	High	FL, IA, KY, ME, NE, NC, PA, WV
Sales tax on motor fuel	✓	✓	✓	High	CA, GA, HI, IL, IN, MI, NY
Petroleum franchise or business taxes	✓	✓	✓	High	NY, PA
Vehicle Registration and Related Fees					
Vehicle registration and license fees	✓	✓	✓	High	All states
Vehicle personal property taxes	✓	✓	✓	Medium	CA, KS, VA
Excise tax on vehicle sales dedicated to transportation	✓	✓	✓	High	CT, IA, KS, MD, MI, MN, MO, NC, NE, OK, SD, VA, federal for heavy trucks
Tolling, Pricing, and Other User Fees					
Tolling new roads and bridges		✓	✓	Medium	About half the states
Retrofitting tolls to existing roads	✓	✓	✓	Low	VA proposed; others considering
High Occupancy Toll (HOT) lanes, express toll lanes, truck toll lanes	✓	✓	✓	Medium	CA, CO, GA, MN, TX
Vehicle Miles of Travel fees	✓	✓	✓	High	OR testing; recommended by 15-state study
Transit fees (mainly fares)			✓	High	All transit agencies (fares)

Table 7.20 Continued

Revenue Tool	Scope: Preservation & Maintenance	Scope: New Capacity	Scope: Program or Project	Potential Yield	Where Used
Beneficiary Charges and Local Option					
Dedicated property taxes	✓	✓	✓	High	Many local governments
Beneficiary charges/value capture (impact fees, tax increment financing, mortgage recording fees, lease fees)		✓	✓	Low	Many states and localities (e.g., CA, FL, NY, OR)
Local option taxes for highway improvements					
Local option vehicle or registration fees	✓	✓	✓	Med.	21 states
Local option sales taxes	✓	✓	✓	High	22 states
Local option motor fuel taxes	✓	✓	✓	Medium	10 states
Other Dedicated Taxes					
Dedicate portion of state sales tax	✓	✓	✓	High	CA, IN, KS, MA, MS, NY, PA, UT, VA
Miscellaneous transit taxes (lottery, cigarette, room tax, rental car fees, etc.)			✓	Low	Various states and localities
General Revenue	✓	✓		High	Most states and localities

Source: NCHRP "Future Financing Options to Meet Highway and Transit Needs," Table 3.1

Currently Authorized Hidden Valley Revenue Options

Table 7.21 shows which jurisdictions are currently using each available transportation funding source.

Under "property-related taxes and fees," all of the identified options are currently authorized, but their use varies. Three jurisdictions allocate general fund dollars to transportation. Only one jurisdiction (Avondale) is currently using secondary property taxes to repay general obligation bonding. One jurisdiction (Buckeye) reports using improvement districts. All but two jurisdictions (MCDOT and Gila Bend) use development impact fees to fund transportation capacity improvements.

Maricopa County voters approved a 20-year extension (through 2025) of a countywide one-half cent transportation sales tax, which is deposited in the Regional Area Road Fund, with roadway projects administered primarily by the Arizona Department of Transportation and transit improvements by the Regional Public Transit Authority. Pinal County voters also extended a countywide one-half cent transportation sales tax through 2025, with the revenue distributed to each jurisdiction based upon its proportion of countywide population.

Only cities and towns are authorized to levy general sales taxes or construction sales taxes. Avondale voters approved a one-half sales tax for capital improvements, including transportation, in 2001. Gila Bend and the City of Maricopa allocate a portion of their general sales tax revenues to capital improvements. Buckeye has a construction sales tax that it partially allocates to transportation. A construction sales tax as an increment of local sales tax (usually 1% to 2%) above the jurisdiction's base rate, and applied only to specific construction-related activities. The use of construction sales tax revenue is determined by the local government, but is typically dedicated to infrastructure improvements needed to support new growth.

All of the jurisdictions could use general obligation bonding to support transportation improvements. Maricopa County has a high legal debt limit, but currently has a policy against debt financing. Pinal County currently has no outstanding general obligation bonding, and therefore has its full legal debt limit available as of June 30, 2007. Avondale, Buckeye, Casa Grande and Goodyear have an aggregate currently available general obligation debt capacity of $161.2 million.[18] Neither Maricopa County nor Gila Bend has an impact fee program. Maricopa County recently began a study of impact fees for roads and other purposes.

Table 7.21 Currently Authorized Revenue Options, Used and Not Used

Revenue Sources		MCDOT	Avondale	Buckeye	Gila Bend	Goodyear	Pinal County	Casa Grande	Maricopa
Property-Related Taxes and Fees	Primary property taxes	≠	□	≠	□	□	≠	≠	≠
	Secondary property taxes	≠	□	≠	≠	≠	≠	≠	≠
	Improvement or community facilities districts	≠	≠	□	≠	≠	≠	≠	≠
	Development impact fees	≠	□	□	≠	□	□	□	□
	Private contributions	Unk	Unk	Unk	Unk	Unk	Unk	Unk	Unk
Sales Taxes	General sales tax	0	□	≠	□	≠	0	≠	□
	Transportation sales tax	*	≠	≠	≠	≠	□	□	≠
	Construction sales tax	0	≠	□	≠	≠	0	≠	≠
□	Authorized and used								
≠	Authorized but not used								
0	Not authorized								

Unk Unknown due to lack of data
*Maricopa County has a transportation sales tax, but MCDOT is not a major recipient.

Source: Curtis Lueck & Associates

Revenue Options Requiring State Action

Table 7.22 identifies additional revenue options that would require authorization through changes in state law. Legislative changes could either raise new revenue directly or permit a local option.

The state could increase fuel taxes, index these taxes to inflation, or do both. A citizen initiative from 1992 mandates that any tax increase requires a two-thirds ("supermajority") vote of the legislature, however. Alternatively, the legislature could authorize local governments to levy their own fuel taxes, and this is exempt from the supermajority requirement by Article 9, § 22(C)3 of the State Constitution.

The state could levy a sales tax on vehicles or fuel, or a general sales tax with the revenue dedicated to transportation. Alternatively, the legislature could allow local governments to levy vehicle-related taxes and fees. A sales tax—except on motor fuel--could be used for modes other than highways.

Table 7.22 Transportation Revenue Options Requiring State Approval

Revenue Source Category		State Options	Local Government Options
User Fees	**Indirect User Fees**		
	Fuel Taxes	Increase and/or index fuel taxes	Local option for motor fuel tax, with indexing permitted
		Levy a sales tax on sale of motor fuels	
	Vehicle-Related Taxes/Fees	Vehicle excise tax dedicated to transportation	Local option for vehicle related taxes or fees
		Vehicle personal property tax	Local option for vehicle personal property tax
	Pricing Mechanisms	Tolling new roads and bridges	Congestion pricing
		HOT lanes	VMT fees
		VMT fees	
Specialized Taxes	**Sales Taxes**	Statewide general sales tax for transportation	Enable Maricopa County to impose an additional transportation sales tax
	Impact Fees	Impact fee for state highways	Enable local jurisdictions to levy impact fees for state highways

Source: Curtis Lueck & Associates

Regarding pricing mechanisms, the state probably is more suited to use toll facilities, while local governments are more likely to benefit from congestion pricing. Both the state and local governments could consider VMT fees. The legislature could also consider fees to address development impacts on the state highway system.

Innovative Financing Options

Table 7.23 presents an overview of currently discussed innovative transportation financing options. This classification is derived from the U.S. Department of Transportation (USDOT) "Innovative Finance for Surface Transportation" website.

USDOT defines "innovative finances" to include the following categories, with examples from the USDOT website shown in Table 7.23:

- New or non-traditional sources of revenue
- New financing mechanisms designed to attract additional investment
- New funds management techniques
- New institutional arrangements

Each of the innovative financing options identified below is already in use, either in Arizona or elsewhere.

The state of Arizona already uses Transportation Infrastructure Finance and Innovation Act (TIFIA) support, the state infrastructure bank, Grant Anticipation Revenue Vehicles (GARVEES), Grant Anticipation Notes (GANS) loans, revenue bonds (HURF and RARF), and Board Funding Obligations. All of these strategies fund projects through new debt which is retired by committed federal and state funding. Accordingly, they are financing mechanisms that build today's roads with tomorrow's dollars. They are not funding sources, *per se*. For a detailed discussion on these and other sources, the reader is referred to the FHWA Innovative Finance website at www.Innovativefinance.org .

Table 7.23 Transportation Innovative Financing Overview

Federal Loans and Credit Support
Transportation Infrastructure Finance and Innovation Act (TIFIA)
Section 129 loans
State Credit Assistance
State infrastructure banks
Bonding and Debt Instruments
Municipal/public bond Issues
Revenue bonds
General obligation bonds
Limited and special tax bonds
Hybrid bonds
Private activity bonds
Anticipation Notes
Grant Anticipation Revenue Vehicles (GARVEES)
Transit Grant Anticipation Notes (GANS)
Private bond issues
Certificates of participation
Shadow tolls
Federal Matching Flexibility
Tapered match
Third party donations
Using federal funds as match
Toll credits
Program match

Source: Derived from U.S. Department of Transportation (USDOT) "Innovative Finance for Surface Transportation" website www.innovativefinance.org.

7.4 Conclusion: Policy Considerations and Strategies for Further Discussion

A series of reports paints a grim picture for transportation funding today and in the future: costs of necessary capital improvements and operations/maintenance vastly exceed available and expected revenue. The shortfall may result in increasing congestion, a stifled state economy, compromised traffic safety, and an unhappy traveling public.

On a broad-brush level, there are four options for addressing this gap:

- Raise revenue to more fully cover costs;
- Substitute lower-cost alternatives--such as travel demand management, transportation system management, and Intelligent Transportation Systems--for more costly capacity solutions;
- Accept lower performance standards to bring revenue and needs into balance; or,
- Some blend of these three strategies.

It is apparent that no single option will close the gap between needs and revenue. The need exists to investigate an array of revenue sources, including both current sources and new or enhanced sources.

An effective roadway system is critical to the state's current and future economy. Additional action to expand the revenue base can be taken at the state, municipal and county levels. Successful local revenue sources have included development impact fees, construction sales taxes, and special districts. The state could authorize regional impact fees, impact fees for transit, and impact fees for state highways; it could further empower local government with more local options to raise revenue.

The estimated cost of arterial roadway capacity consumed by each new home built in urban and suburban Arizona is approximately $15,000. The cost of local and collector roadway capacity is rolled into the construction of new development projects and passed on to the end user (the homeowner and motorist).. The cost of high-capacity roadways (freeways and Interstate highways), which can add another $5,000 to $10,000 per dwelling unit, is frequently funded by the state or federal government with local matching funds. Therefore, the total cost of required new freeway and arterial capacity is about $20,000 to $25,000 per new home. However, impact fees and other existing sources typically raise less than $5,000 per home, leaving a large shortfall and funding conundrum. In addition, the cost of long-term maintenance is roughly equal to the capital cost of initial construction, when the latter is amortized over the useful life of the roadway.

For the Hidden Valley, the following list offers strategies for raising revenue to meet the needs of a rapidly growing population:

- Use improvement districts, revenue bonds, innovative financing, and construction sales taxes to help resolve as many as possible of today's capacity and maintenance deficiencies. No new legislation is needed.

- To accommodate new growth, establish a regional development impact fee program for the major corridors identified in the study, possibly including state routes. The program could be modeled after other jurisdictions (see for example California) using new legislation. No new legislation is needed if joint powers agreements (such as intergovernmental agreements) are used. (New legislation would be needed, however, to enable the state to collect impact fees for improvements to the ADOT highway system.)

- Consider the use of community facilities districts to fund offsite improvements for new development.

- Vigorously pursue toll roads along one or more new or existing corridors. New toll legislation may be needed to enhance the feasibility of toll roads anywhere in Arizona. For example, current state law requires the availability of a reasonably convenient free alternative.

- Implement a life cycle cost program, similar to MAG's RARF, for the Hidden Valley area, to address both capital and maintenance needs. No new legislation is required.

- Implement a concurrency program, in which new development cannot proceed into construction until needed roadways are funded, permitted, and fully programmed for implementation. No new legislation is needed. This can be incorporated into each municipality's general plan and each county's comprehensive plan, pursuant to ARS Title 9 and Title 11, respectively.

- Seek legislative approval for local revenue options such as a local gasoline tax, a local sales tax on fuel, and local vehicle registration fees. This requires a simple majority vote at the legislature followed by local adoption.

- Seek an increase in the state gasoline tax, and possibly distribution of a larger percentage of HURF to counties and municipalities in order to implement the Hidden Valley plan. A tax increase requires a supermajority vote of the legislature to comply with the constitution, but changes to the HURF formula require a simple majority vote.

- Seek an increase in the federal gasoline tax, with a larger share being available to counties and municipalities for implementing the Hidden Valley plan. This requires action by the U.S. Congress.

- Strive for a balanced transportation system, with due consideration of land use patterns, that incorporates transit and alternative modes of travel. This will require investigation of additional sources of funding for public transportation in the study area, such as a ¼ to ½ percent sales tax, a property tax, or a new transit district with taxation authority. These options may require new legislation, but some may be achievable under current statutes.

Endnotes

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[1] This section was included in the Interstate 10/Hassayampa Valley Roadway Framework Study and is repeated here for continuity.
[2] AAA auto cost estimates for a sedan. Further information available at http://www.aaaexchange.com/Assets/Files/20073261133460.YourDrivingCosts2007.pdf.
[3] The federal rate also includes 0.1¢ for the leaking underground storage tank (LUST) cleanup program, for a total of 18.4¢ per gallon.
[4] ARS §28-2003.
[5] On the other hand, the sales tax on vehicle purchases is substantial[5], yet typically flows into the general fund at the state and local level and is not considered a transportation revenue source. In Arizona, the total sales tax on a new $25,000 vehicle can exceed $2,000.
[6] ARS §28-5433.
[7] Data obtained from the World Bank, 2005.
[8] Counties cannot impose this type of sales tax.
[9] The calculation is thus: $300,000 x 65% x 2% = $3900. The 65% factor is imposed by state law.
[10] Minor allocations from the motor fuel taxes are allocated to the Leaking Underground Storage Tank Trust Fund and the General Fund.
[11] The Equity Bonus Program provides funding to states to ensure a minimum rate of return to the state of contributions from the state to the Highway Account.
[12] Ibid.
[13] Under Collections, ADOT reports General Fund Transfers of $58 million between FY 1998 and 1991.
[14] Source: ADOT 2006 Vehicle License Tax report.
[15] Source: ADOT Public Transportation Division.
[16] See http://www.api.org/policy/tax/stateexcise/upload/December_2007_notes.pdf).
[17] No data was collected on jurisdictions that are involved with transit and how those services are being funded with transit fares.
[18] The other two jurisdictions were Gila Bend and Maricopa City, neither of which currently have a significant amount of available legal debt limit. See Arizona Department of Revenue reports on bonded indebtedness for FY 2006-07 at http://www.azdor.gov/ResearchStats/bonding/FY07%20Report_web.pdf.

ABBREVIATIONS

AADT	Annual Average Daily Traffic
ADA	Americans with Disabilities Act
ADEQ	Arizona Department of Environmental Quality
ADMP	Area Drainage Master Plan
ADMS	Area Drainage Master Study
ADOT	Arizona Department of Transportation
ADWR	Arizona Department of Water Resources
AGFD	Arizona Game and Fish Department
AMA	Active Management Area
APS	Arizona Public Service
ARS	Arizona Revised Statutes
ASLD	Arizona State Land Department
BFE	Base Flood Elevation
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BRT	Bus Rapid Transit
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CAAG	Central Arizona Association of Governments
CAFR	Comprehensive Annual Financial Report
CCI	Construction Cost Index
CDP	Census Designated Place
CFD	Community Facilities District
CFPO	Cactus Ferruginous Pygmy Owl
CHP	County Highway Purposes
CIP	Capital Improvement Program
CO	Carbon Monoxide
DCR	Design Concept Report
EA	Environmental Assessment
EIS	Environmental Impact Statement

ENR	*Engineering News Record*
EPA	Environmental Protection Agency
FCDMC	Flood Control District of Maricopa County
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FR	Federal Regulations
FY	Fiscal Year
GANS	(Transit) Grant Anticipation Notes
GARVEES	Grant Anticipation Revenue Vehicles
GIS	Geographic Information Systems
GRIC	Gila River Indian Community
HC	Hydrocarbons
HDMS	Heritage Data Management System
HOT	High Occupancy/Toll
HURF	Highway User Revenue Fund
I	Interstate
IFA	Impact Fee Area
ISA	Initial Site Assessment
L	Loop
LOS	Level of Service
LTAF	Local Transportation Assistance Fund
LUST	Leaking Underground Storage Tank
MAG	Maricopa Association of Governments
MC	Maricopa County
MCDOT	Maricopa County Department of Transportation
MCPDD	Maricopa County Planning and Development Department
MLT	Michigan Left Turn
MP	Milepost
MPA	Municipal Planning Area
MPO	Metropolitan Planning Organization
MSAT	Mobile Source Air Toxics

NAAQS	National Ambient Air Quality Standards
NAFTA	North American Free Trade Agreement
NCHRP	National Cooperative Highway Research Program
NHPA	National Historic Preservation Act
NHS	National Highway System
NRCS	National Resources Conservation Service
NRHP	National Register of Historic Places
NO_2	Nitrogen Dioxide
O_3	Ozone
O-D	Origin-Destination (Origins and Destinations)
PAG	Pima Association of Governments
PM	Particulate Matter
PUE	Public Utility Easement
PVNGS	Palo Verde Nuclear Generating Station
RARF	Regional Area Road Fund
RMP	Resource Management Plan
RPTA	Regional Public Transportation Authority
RSR	Regionally Significant Route (or road)
RSRSM	Regionally Significant Routes for Safety & Mobility
RTP	Regional Transportation Plan
R/W	Right-of-Way
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SAZ	Socioeconomic Analysis Zone
SATS	Small Area Transportation Study
SB	State Business Route
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SR	State Route
SRP	Salt River Project
SRT	Study Review Team
TAZ	Transportation Analysis Zone

TI	Traffic Interchange
TIFIA	Transportation Infrastructure Finance and Innovation Act
TIP	Transportation Improvement Program
TNC	The Nature Conservancy
UP or UPRR	Union Pacific Railroad
US or U.S.	United States
USC	United States Code
USDA	United States Department of Agriculture
USDOT	United States Department of Transportation
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
V/C	Volume/Capacity
VHT	Vehicle Hours of Travel
VLT	Vehicle License Tax
VMT	Vehicle Miles of Travel